The Unsuccessfully Closed Blind Client: Characteristics of a Nonemployment Outcome

Technical Report

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TABLE OF CONTENTS

PAGE

LIST OF TABLES..... v

LIST OF FIGURES..... vii

I. INTRODUCTION..... 1

Unemployment and the Disabled..... 1
Unemployment: General Disability Factors..... 2
The Unsuccessful Closure Client..... 2
Prediction Models and Special Services..... 4
Outcome Studies with Nonvisually Impaired Samples..... 6
Outcome Research with Blind and Low Vision Samples..... 8
Purpose of this Study..... 18

II. METHOD..... 21

Subjects..... 21
Variables in the Database..... 21

III. RESULTS AND DISCUSSION..... 31

Descriptive Findings for Employment Outcome Groups..... 31

Definitions..... 31
Visual Impairment and Other Disability Characteristics..... 38
Selected Descriptors of the Employment Outcome Groups..... 46

Discriminant Analysis and Classification..... 54

Overview..... 54
Derivation Stage..... 55
Preliminary Analyses..... 55
Primary Discriminant Analyses..... 59
Interpretation of the Discriminant Functions..... 67
Differences Between Outcome Groups for the Discriminating Variables..... 68

Categorization of Discriminating Variables and Unsuccessful Client Profiles..... 68

The Unsuccessful Versus Competitive Closure Client..... 68

Profile of the Unsuccessful Versus Competitive Closure Client.... 73
Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research..... 75
Biographical and Disability Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research..... 76

TABLE OF CONTENTS

PAGE

Financial/Disincentive Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research..... 77
Environmental Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research..... 78
Occupational History Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research..... 79
Interpretation of Differences Between Unsuccessful and Competitive Clients..... 79

The Unsuccessful Versus Sheltered Closure Client..... 81

Profile of the Unsuccessful Versus Sheltered Closure Client..... 81
Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Sheltered Closure Clients and Relationships to Past Research..... 83
Biographical and Disability Variables that Discriminate Unsuccessful from Sheltered Closure Clients and Relationships to Past Research..... 84
Interpretation of Differences Between Unsuccessful and Sheltered Clients..... 85

The Unsuccessful Versus Homemaker Closure Client..... 86

Profile of the Unsuccessful Versus Homemaker Closure Client..... 86
Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research..... 88
Biographical and Disability Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research..... 90
Financial/Disincentive Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research..... 91
Environmental Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research..... 92
Interpretation of Differences Between Unsuccessful and Homemaker Clients..... 92

IV. OBSERVATIONS..... 95

Program/Administrative Issues..... 95
Practice Issues..... 99

V. REFERENCES..... 103

LIST OF TABLES

PAGE

Table 1: List of Variables..... 25

Table 2: Work Status and Employment Group..... 34

Table 3: Primary Eye Disorder Groups..... 40

Table 4: Secondary Eye Disorder Groups..... 41

Table 5: Tertiary Eye Disorder Groups..... 42

Table 6: Affections of Successful and Unsuccessful Compared with a 1978 General Blind Sample..... 45

Table 7: Three Most Prevalent Secondary Disability Groups..... 47

Table 8: Three Most Prevalent Tertiary Disability Groups..... 47

Table 9: Summary Means, Standard Deviations, and Valid N for Selected Variables for Elderly Blind Sample..... 48

Table 10: Classification Results for the Discriminant Analysis of Unsuccessful vs. Successful Closures..... 57

Table 11: Classification Results for the Discriminant Analysis of the Four Outcome Groups..... 58

Table 12: Discriminant Function Summaries..... 60

Table 13: Classification Results for Unsuccessful vs. Competitive Analysis..... 62

Table 14: Classification Results for Unsuccessful vs. Sheltered Analysis..... 63

Table 15: Classification Results for Unsuccessful vs. Homemaker Analysis..... 64

Table 16: Predictive Accuracy of Discriminant Analysis..... 65

Table 17: Summary and Significance of Discriminating Variables..... 69

Table 18: Summary Means for Discriminating Variables in the Unsuccessful vs. Competitive Analysis..... 70

Table 19: Summary Means for Discriminating Variables in the Unsuccessful vs. Sheltered Analysis..... 71

Table 20: Summary Means for Discriminating Variables in the Unsuccessful vs. Homemaker Analysis..... 72

LIST OF TABLES

PAGE

Table 21: Categories of the Variables Discriminating Unsuccessful from Competitive Clients..... 74

Table 22: Categories of the Variables Discriminating Unsuccessful from Sheltered Clients..... 82

Table 23: Categories of the Variables Discriminating Unsuccessful from Homemaker Clients..... 87

LIST OF FIGURES

PAGE

Figure 1: Total Blind Sample..... 22

Figure 2: Percent in Employment Groups..... 33

Figure 3: Reason Not Rehabilitated..... 36

Figure 4: Reasons for Unsuccessful Closure..... 37

Figure 5: Blindness and Outcome..... 39

Figure 6: Gender..... 51

INTRODUCTION

Employment plays an integral part in the disabled individual's life:

> Employment is such a highly valued goal in our society that virtually any job is preferred to none. For working-age men and increasingly for women, a job is the primary basis for respectability and a personal sense of worth. This value pervades the definition and response to physical impairments. Disability is usually defined with respect to the world of work. Society's main interest in rehabilitation has been vocational rehabilitation, and specifically job placement - any job placement. (Kirchner & Peterson, 1980, p. 203)

Given the social and personal importance of employment, this report focuses on the individual who is blind or severely visually impaired and who is a client of a state vocational rehabilitation agency and, more specifically, whose case file was closed in status 28. Status 28 is the code used by state rehabilitation agencies to denote that the individual did not reach the vocational objective developed during the rehabilitation process and that the outcome of the process was unemployment.

Unemployment and the Disabled

The following review of literature includes a general description of unemployment as related to the disabled population, of possible influences of reductions in vocational rehabilitation (VR) funding on VR closure, and of the unemployed closure category. Examples of some of the models developed to aid in the identification of the potentially unemployed client are briefly described, as well as a program designed to increase their chances of closure success. Finally, the major conclusions of outcomes studies, categorized as focusing either on groups with disabilities in addition to visual ones or exclusively blind and visually impaired groups, are summarized. The combination of the information from these various subject areas provides a background for the study of vocational rehabilitation clients who are blind or severely visually impaired and are closed as unemployed.

Unemployment: General Disability Factors

The impact of a disability on the earnings of an individual is severe enough without the increased financial strain produced by the disabled person experiencing unemployment (see e.g., Davis, 1972). Unemployment has multiple effects on an individual's life and role performance. With respect to family income, Terry (1982) reported that unemployment of one family member resulted in (a) a reduction in median family income of 21% and (b) a significant percentage of families falling below the poverty income level. The experience of unemployment and loss of earnings due to visual disability has also been reported to impact on family structure, resulting in unfavorable responses by the family ranging from role stress to the breakup of the family (Moore, 1984; Wacker, 1984).

The Unsuccessful Closure Client

Definitions. An unsuccessful closure, also referred to as unemployed or nonrehabilitated, is an individual who fails to complete the vocational rehabilitation program. The two types of unemployed closures, depending on the point in the VR process when the client's case was closed, are (a) Status 30 - closed before an Individualized Written Rehabilitation Plan (IWRP) was completed and (b) Status 28 - closed after an IWRP was completed. The present study focuses on Status 28 closures. VR counselors close clients in the unsuccessful category for one of the following reasons: unable to locate, handicap too severe, client refused services, client died, was institutionalized, transferred, or failed to cooperate.

Definitional problems. Research attempting to describe the clients who are categorized as unemployed is very difficult due to the qualitatively different reasons a client receives this closure determination. For instance, the unsuccessful closure of a client simply because he or she moved to another

state may have no bearing on the vocational potential of the client or the efficacy of the VR program. This category of "unsuccessful closure," as such, is due to administrative definition. Similarly, VR services would minimally affect clients whose reasons for an unsuccessful closure were unable to locate, death, or transfer. Clients whose handicap was too severe or required institutionalization may have been incorrectly determined to be eligible or afflicted with a progressive disability or disease.

Roessler (1980) discussed the steps to improve the goal setting process in an effort to increase the chances of successful vocational rehabilitation. The importance of proper goal setting during the writing of the IWRP is reinforced by Wacker's (1984) description of the tendency of rehabilitants to set unrealistic rehabilitation goals, despite the advice of counselors, which often lead to client disillusionment and, ultimately, an unemployed closure. Because there are several reasons for unsuccessful/unemployed case closure, the unsuccessful outcome group is heterogeneous. Despite their heterogeneity, these individuals have in common a failure to attain employment after being provided an array of rehabilitation services. The issue of the extent of differences among unsuccessfully closed blind and visually impaired clients is successfully examined in this study. However, a pragmatic approach is taken which accepts the administrative definition of the unsuccessful 28 closure and seeks to identify antecedents of unsuccessful closure even though this closure category is not a "pure" category of clients.

The goal of identifying differential service patterns through comparisons of clients closed unemployed with clients closed in successful closure categories can be misleading, since the successful closure category consists of competitive, sheltered, and homemaker closure groups, which have different characteristics. Each of these successful closure categories should be compared

individually with the unsuccessful closure group for the most appropriate picture of the differences between unsuccessful and successful closures. The need for this approach has been documented by previous research (Giesen & Ford, 1986; Giesen et al., 1985).

Prediction Models and Special Services

According to Cooper (1974), prediction research should be used to establish predictive approaches which then could be applied within an experimental design to test the relative strengths and weaknesses of program variables. Clients predicted to have a low success probability should receive the specific mix of services identified by the study to increase their chances for a successful outcome. Several approaches have been proposed based on data from rehabilitation clients who had disabilities other than visual ones.

Weickel and Johnson (1974) designed a simple nine-step model to aid in the identification of clients with a higher probability of rehabilitation failure. A summation of weighted factors, based on data from the agency's own clients, yields a cutoff score for successful clients. Those clients who fall below the cutoff are selected to receive additional services aimed at increasing their chances for success.

A multiple regression analysis of demographic data was employed by Worrall and Vandergroot (1980) to devise a nonarbitrary weighting system to identify clients who would be at a high risk for an unemployed closure. A followup report by the same authors in 1982 found moderate evidence for the use of the model in predicting successful (status 26) closures. The model performed less well in predicting an unemployed closure, prompting the authors to suggest further study of the differences between 26 and 28 closures. Other prediction models which utilize more complex statistical analysis include a closure index by Miller and Barillas (1967), predictors identified through

regression analysis (Lawlis & Bozarth, 1971), and determination of success based on probability trees (Bolton, 1972a).

Rapid Problem Resolution (RPR), an example of programs intended for the difficult-to-rehabilitate client, was designed to reduce the number of status 28 closures. RPR is focused on the client's social system, involving the people comprising the social system in the rehabilitation process, and applying "uncommon-sense" solutions (similar to the layman's term "reverse psychology") to the client's problems in the form of prescriptions for change in the client's social system (Daggett, 1978). Subsequent studies describing the efficacy of RPR report "converting" small samples of unemployed clients to the successful category at rates of 30% (N=85) and 66% (N=26) (Daggett, Kempner, & Costello, 1982; Kempner & Daggett, 1985).

Two recent studies employing 619 blind and severely visually impaired clients (Giesen et al., 1985) and 188 elderly blind clients (Giesen & Ford, 1986) used stepwise multiple discriminant analysis to identify variables from an extensive list of potential predictors of employment outcome. Predictor variables were drawn from categories relating to the rehabilitation process and services; personal and disability characteristics; financial and disincentive factors; and geographic, occupational history, and counselor-related variables. A relatively small number of predictor variables were able to correctly classify cases into their appropriate outcome groups at moderate to high accuracy rates. These studies also reported that clients closed in competitive, sheltered, homemaker, or unsuccessful statuses had profiles on the predictor variables that were useful in anticipating client outcome, in identifying problem cases so that special rehabilitation programs could be developed, and in providing agencies with information to predict demands for rehabilitation services associated with particular types of closures.

Outcome Studies with Nonvisually Impaired Samples

The following studies were identified which relate to closure of VR clients as unemployed. Studies which described the successful rehabilitant were excluded from consideration if they failed to include a comparison of the unemployed client with other outcome groups.

The rehabilitation outcome literature is replete with studies identifying nonvisual demographic factors which predict outcome. While comparison of these studies is difficult because of methodological, population, and criteria differences, there is some agreement on those demographic factors which are related to outcome. Since the number of outcome studies is considerable, only the more consistent and significant results are summarized here.

Successful rehabilitation outcome has been interpreted in various ways by different researchers. While most studies utilized a status 26 closure as the criterion for successful outcome, others used salary at closure, occupational level, or placement in training programs as indicative of positive or successful outcome.

The most frequently cited nonvisual demographic characteristics correlated with successful outcome are age (younger), race (white), education (higher), and marital status (married) (Berkowitz, Englander, Rubin, & Worrall, 1975). Studies by Barney (1974); Bolton (1972a, 1972b, 1983); Bolton, Butler, and Wright (1968); Dean and Dolan (1985); Demann (1963); Kennedy (1974); Kunce, Cope, Miller, and Lesowitz (1972); McPhee and Magleby (1960); Micek and Bitter (1974); Sankovsky and Newman (1972); and Tseng and Zerega (1976) found that successful rehabilitants generally (a) owned their own homes; (b) were younger at referral, or in their twenties; (c) were younger at the age of onset of disability; (d) were employed wage earners at time of acceptance; (e) were less likely to be welfare recipients; (f) were males; (g) were married; (h) were more

often white; (i) had been more likely to look for work when they attributed their unemployment to their lack of training or lack of jobs in the labor market area rather than attributing their unemployment to their disability; (j) were persons with dependents, usually one dependent; (k) had a slightly higher educational level than the unsuccessful closure clients or had at least a tenth grade education or were more likely to be high school graduates; (l) were referred by educational institutions, the state employment service, private companies, physicians, or self; (m) were physically disabled, or were more likely to be emotionally disabled; (n) were supported primarily by their own earnings or by support of family and friends at referral; (o) were less likely to be receiving public assistance; (p) were more likely to be employed at referral; (q) had higher socioeconomic status; (r) reported higher earnings at referral, had a family income above $600 per month, or higher total family income per month at referral than unsuccessful clients; (s) lived with their spouse and children; (t) participated in social activities with their families; and (u) attended church.

Also, in a study relating mainly to time in various aspects of the rehabilitation program, Tseng and Zerega (1976) reported that in relation to clients receiving successful compared to unemployed closures, successful clients moved more quickly between statuses 00 and 02 (referral to application), required less time in the extended evaluation status (06), required more money for all services, required longer training periods, moved more quickly overall through the rehabilitation process, required less time in the ready for employment status (20), and received more money from the social security trust fund.

While most studies focused on the correlates of successful outcomes, Hammond, Wright, and Butler (1968) composed a list of 25 variables associated

with unsuccessful outcome, based on a comprehensive review of the literature. The unsuccessful rehabilitants were (a) older; (b) either disabled at birth or during later years; (c) married, with the exception of adolescents; (d) supporting no dependents or children; (e) seldom participants in social activities; (f) not attending church; (g) relatively minimally educated; (h) of relatively low intellectual level; (i) nonwhite; (j) persons with an arrest record or history of antisocial acts; (k) persons with a history of alcoholism; (l) from families with neutral or negative attitudes toward rehabilitation; (m) not living with their families; (n) not having close family relationships; (o) applicants or benefit recipients of SSDI; (p) possessing some general health problems aside from their disability; (q) not home or automobile owners; (r) of lower socioeconomic status; (s) of lower occupational level; (t) lacking a record of full employment or vocational adjustment; (u) supported primarily from sources other than wages; (v) referred from a hospital or medical center; (w) mentally retarded or had psychiatric disturbance; (x) welfare recipients; and (y) passive-dependent, having a relatively low level of ego strength.

The results presented in this section reported a number of personal variables predictive of either successful or unsuccessful rehabilitation outcomes. These results came from a wide array of studies, with no two employing identical procedures, techniques, predictor variables, or disability groups. All studies cited were conducted with sighted or mixed disability groups. Many of the investigations contained visually impaired individuals within general case load; however, none focused on a blind or legally blind client population.

Outcome Research with Blind and Low Vision Samples

There have been relatively few studies attempting to predict rehabilitation outcome with legally blind clients. The majority of previous

studies with this client population have been descriptive in nature and related personal characteristics of successful rehabilitants. Other studies dealt with a segment of the blind population, such as war blinded, or predicted nonvocational outcomes such as adjustment to blindness or ability for independent living. Both predictive and descriptive outcome studies are summarized in this section to lend support to the contention of the present study that rehabilitation outcomes can be predicted in blind and legally blind clients.

In a study of personal characteristics of blind persons working in professional occupations, Bauman and Yoder (1963) surveyed 408 legally blind persons employed in 14 occupations. The subjects were said to have achieved a level of financial success and recognition in their professions equal to that of their sighted counterparts. Over 50 percent of the subjects were totally blind, and less than 14 percent had any useful residual vision. The most common traits possessed by the successful professionals were good mobility skills, above average written and spoken communication skills, good memory, pleasant appearance, and adequate self-confidence.

Bauman and Yoder (1964) also investigated the qualities of over 700 clerical, industrial, and service employees. Based on the descriptive data collected, the typical blind worker in those occupations (a) was usually male; (b) was between 35 and 45 years of age; (c) had some travel vision; (d) traveled independently using a cane; (e) was usually a high school graduate; (f) was married with children; (g) produced on an equal level with sighted workers; (h) obtained employment through a state agency for the blind; (i) was trained on the job by his employer; (j) was satisfied with services received; (k) had no major health problems; and (l) believed persistence, self-confidence, and hard work were the keys to success.

An outcome study by Scholl, Bauman, and Crissey (1969) reported factors which contributed to the vocational success of visually handicapped clients. The study used 16 personal variables collected on 644 subjects from five states. Vocational success was defined in terms of the three criterion variables: percentage of time worked, income, and socioeconomic index for occupations. A multiple regression analysis was used to find the best predictor variables for each of the three outcome criteria. The best predictors for percentage of time worked were (a) IQ, (b) sex, (c) travel ability, (d) educational level, and (e) other disabilities. The best predictor variables for income were (a) IQ, (b) sex, (c) functional vision, (d) marital status, (e) educational level, and (f) other disabilities. The best predictor variables for socioeconomic index were (a) IQ, (b) sex, (c) educational level, (d) money spent, (e) travel ability, and (f) other disabilities. The predictor variables common to all three outcome criteria were (a) intelligence, (b) sex, (c) education, and (d) disabilities other than blindness. Descriptive data also revealed that the clients were employed in a limited range of occupations with more than 50 percent of the men employed in 13 occupations and 50 percent of the women employed in only 9 occupations.

Knowles (1968/1969) employed three levels of inferential statistics to study successful and unsuccessful vocational rehabilitation of 461 legally blind clients. The sample contained 245 successful rehabilitants and 216 unsuccessfully closed clients. He used 13 predictor variables to discriminate between successful and unsuccessful clients. Five of the variables were classified as interpersonal variables, while 8 were classified as external life-space variables. Each of the three statistical techniques, Chi-square, analyses of variance, and discriminate analysis, produced slightly different results. The only variables found significant in all three analyses were

mobility and orientation training and vocational classification before rehabilitation. Three other highly significant discriminators between the success and nonsuccess groups were (a) age blindness occurred, (b) years of blindness, and (c) age at rehabilitation.

McGowan (1972) conducted a study using 225 blind patients enrolled in a Veterans Administration rehabilitation center for the blind. All subjects in the study were military veterans who received adjustment to blindness training at the rehabilitation center. Length of treatment time and rehabilitation training success were the two criterion variables identified with successful rehabilitation. McGowan determined which of 50 variables would predict success in terms of the two criterion variables. A stepwise multiple regression was used for the analysis. The variables found to be predictive for rehabilitation training success were (a) age, (b) ethnic group, (c) religion, (d) other rehabilitation attempts, (e) IQ, (f) use of aids, (g) service-connected blindness, (h) residence, (i) willingness of a family member to participate in the family program, (j) eye condition, (k) hearing ability, (l) other disabilities, and (m) use of medications. The following variables were found to be significant predictors for length of treatment time: (a) marital status, (b) IQ, (c) patient's past employment, (d) eye condition, (e) hearing ability, and (f) other disabilities.

Personal and program service characteristics were investigated by Crouse (1974) to determine which, if any, were useful predictors of rehabilitation outcome for legally blind clients. A successful outcome was indicative of the client being trained and placed and working for a minimum of 30 days continuously in gainful employment (status 26 closure). The unsuccessful outcome was synonymous with a status 28 or status 30 closure (not rehabilitated). The sample consisted of 276 subjects from the closed files of

the state rehabilitation agency in Colorado. Twenty-six predictor variables, 6 identified as personal characteristics and 20 identified as characteristics of program service components, were analyzed by multiple regression analysis. Rehabilitation outcome was predicted by Crouse with 88% accuracy. In other words, 246 subjects were correctly predicted to belong to either the successful or unsuccessful groups. The personal characteristic variables of age, sex, race, marital status, number of dependents, and educational level were not as useful as the program service characteristics in predicting rehabilitation success. Within the group of program service variables, personal adjustment services and restoration proved to be the most useful predictors of group membership.

Ammons (1978) investigated whether characteristics observable from data in the files of blind persons could discriminate between those who would benefit from adjustment to blindness training and those who would not. Subjects were 110 blind individuals who received adjustment to blindness training at a rehabilitation center in South Carolina. The predictor variables were 19 pieces of information gathered from clientst files and interviews with field counselors. Benefit category data were collected at 90 days and at 1 year after the completion of training. Those variables which showed a significant relationship to the dependent variable, benefit category, were used in a stepwise discriminate analysis. Cause of blindness, level of intelligence, and public assistance were the variables found to discriminate between those who benefited from the adjustment training and those who did not benefit. There was an insignificant change in categorization from the 90 day data collection point to the 1 year followup. Adjustment to blindness training was therefore found to be most beneficial for the more intelligent blind person who was not receiving public assistance and who had been adventitiously blinded.

Gillman, Simon, and Shinn (1978) conducted an outcome study on an intensive rehabilitation training program for blind, multiply handicapped adults. Clients of the program were diagnosed as having a limited potential for independence and vocational rehabilitation. Background data on the 44 clients were collected at entrance to the program, exit from the program, and at followup. One of the primary success criteria was employment or training participation following completion of the intensive program. Seventy percent were considered successful at followup, while 30% were unemployed. Among the significant findings of the study: (a) The more remaining vision the client had, the more likely he was to be an independent traveler and the more money he was likely to earn; (b) the longer the client was out of the program, the less likely he was to be employed and to retain independent living skills; (c) clients who completed high school, entered the program directly from school, or were out of school less than six months before program entrance were more likely to be successful; and (d) the most successful clients were males under 25 years of age.

Over 31,000 blind and visually impaired persons closed as clients of the federal-state vocational rehabilitation system in 1980 were the subjects of a study by Kirchner and Peterson (1982). They investigated the effects of disability-related and social-demographic background characteristics on three rehabilitation outcomes. Almost four-fifths of all clients were closed within the competitive employment, sheltered work, or homemaker outcome groups. Those clients closed in competitive employment generally (a) were less severely visually impaired, (b) had no second disabling condition, (c) were slightly more likely to be male, (d) were under 34 years old, (e) were either never married or currently married, (f) had at least a twelfth-grade education, (g) were white, (h) received neither SSI nor SSDI, and (i) were either not working or were

competitively employed at referral. The vast majority of sheltered workshop closures were more severely visually impaired, and considerably more than half had a second disabling condition. They were slightly more likely to be male, were between 25 and 54 years old, were never married, had a ninth-grade education or less, and were white. Over a quarter of the group were black; three-quarters were recipients of SSI, SSDI, or both; and the majority were not working at the time of referral. Half the homemaker closures were legally blind, with the other half being visually impaired. Just over half had a second disabling condition, and over three-quarters of the group were female. The homemakers were generally over 54 years old, currently married or widowed, had less than a twelfth-grade education, were white, were either homemakers or not working at the time of referral, and two-thirds received no benefits, while one-third were recipients of either SSI or SSDI.

Several studies investigated attitudes and closure status, concluding that positive attitudes of a blind or low vision rehabilitant's family play a major role in rehabilitation success, were cited by Moore (1984) in an evaluation of the effects that client perceptions of family attitudes have on clients closed in competitive, sheltered, or nonrehabilitated statuses. From data gathered through a postclosure questionnaire, Moore concluded that a wide variety of positive perceptions of family attitudes were more often characteristic of blind clients closed competitively and closed in sheltered employment than for those unsuccessfully closed.

Giesen et al. (1985) collected extensive background and service data on 619 blind and legally blind clients of state rehabilitation agencies in four states to determine the optimum predictors of outcome. The four states, Mississippi, Florida, Ohio, and Kansas, represented a sampling of different geographic locations, agency structures, and urban/rural populations. All

subjects in the study were legally blind. The outcome criteria consisted of four work status categories: Wage Earner I -- competitive employment, self-employment, and business enterprise; Wage Earner II -- sheltered workshop and homebound industry; Nonwage Earner I -- homemaker and unpaid family worker; and Nonwage Earner II -- not working. A multiple discriminate analysis was employed to predict work status outcome from 94 potential predictor variables. The analysis indicated that actual work status group membership was correctly predicted in 68% of the cases. The 10 best predictors of work status category at closure were (a) age at referral, (b) the last occupational goal total vocational quotient (McCroskey, 1980), (c) sex, (d) years disabled prior to referral, (e) number of disabilities in addition to blindness, (f) highest grade completed, (g) on the job training, (h) proximity to counselor, (i) wage category at referral, and (j) whether or not the client received institutional training.

The unsuccessful closure group (Nonwage Earner II) were younger at the onset of blindness than the homemaker group but, as a group, were older at age of onset than either of the two wage earner outcome groups. The unsuccessful group had more years of education than either the sheltered workshop or homemaker groups but less than the competitively employed closure group. The unemployed group had a higher first IWRP total vocational goal quotient (TVQ) than the sheltered workshop or homemaker groups but lower TVQ scores than those of the cases closed in competitive employment. Similarly, the unemployed group received institutional training more frequently than either the sheltered employment or homemaker closure groups but less frequently than those cases closed competitively.

Graves, Bagley, and Chen (1985) evaluated the VR program of the New Jersey Commission for the Blind and Visually Impaired by comparing several VR

process statuses. A sample of 183 cases was selected through a stratified random sample of the 1,436 VR closures for FY 1984. Clients closed in status 28 (N=29) were found to be discriminably different from other closure categories (08, 26, 30) for approximately 16 rehabilitation process variables, some of which were: counselor signed IWRP, number of rehabilitation teachers, number of orientation and mobility instructors, number of changes in occupational goal, nonocular aids used to read and write for employment, expenditures for on-the-job training, and expenditures for surgery and/or treatment.

Giesen and Ford (1986) examined 188 elderly (age 65 and older) blind and legally blind clients from rehabilitation agencies in Florida, Kansas, Mississippi, and Ohio. The purpose of this study was to assist vocational rehabilitation agencies serving elderly blind and visually impaired persons in program planning and allocation of agency resources targeted specifically to increase successful employment closures of elderly blind persons, by identifying factors that were predictive of competitive employment, sheltered workshop employment, homemaker closures, and unemployed closures. Nearly 100 variables from the categories of rehabilitation process, personal, financial, environmental, occupational, and counselor-related variables were analyzed to determine their usefulness in predicting employment outcome of elderly blind clients. Using the 21 predictor variables identified by the stepwise multiple discriminant analysis, a 77% correct classification of employment outcome group was obtained, representing a 71% improvement over the chance correct classification rate. Fifty-seven percent of the significant discriminating variables for the elderly blind sample were rehabilitation process variables: expenditure for personal or vocational adjustment training, expenditure for "other" atypical services, whether restoration services were provided, total

expenditure for rehabilitation facilities, expenditure for hospital and convalescence, expenditure for diagnostic evaluation, whether maintenance was provided, whether diagnostic services were provided, expenditure for trade school training, skill level of the IWRP occupational goal, and total for "other" unclassified expenditures. Biographical and disability-related variables accounted for 29% of the discriminating variables: whether nonoptical aids were used, age at onset of blindness, whether the client had a Spanish surname, total number of disabilities, sex, and expenditure for travel and transportation. There were two discriminating variables in the financial/disincentive category which were: whether the primary source of support at referral was from personal and private sources, and time on public assistance at referral. Proximity to the vocational rehabilitation counselor was the only environmental variable that discriminated the employment groups. No occupational or counselor related variables were among the set of significant discriminating variables.

The studies presented in this section were both descriptive and predictive and they related characteristics of blind and visually impaired clients to vocational and nonvocational outcomes. A number of personal and service variables were identified as predicting income (Scholl, Bauman, & Crissey, 1969), adjustment to blindness (Ammons, 1978), results of a training program (Gillman et al., 1978), and rehabilitation outcome (Crouse, 1974; Giesen et al., 1985; Kirchner & Peterson, 1982; Knowles, 1969; McGowan, 1972) for blind and legally blind clients. This review shows that there are relatively few outcome studies for blind and visually impaired clients of state rehabilitation agencies, and almost a complete lack of outcome studies specifically dealing with blind and visually impaired VR clients closed unemployed.

Purpose of this Study

The present study was designed to assist vocational rehabilitation agencies to better serve blind and visually impaired persons by providing an extensive analysis of the status 28 unsuccessful closure. The study was initiated to provide empirical information on the antecedents of the unsuccessful case closure so that client characteristics and rehabilitation process patterns which lead to unsuccessful closures can be identified early and averted. Thus, the purpose of this study is to identify the characteristics of clients closed as unsuccessful and to establish which factors differentiate this outcome from other outcome groups.

The four employment outcomes were competitive employment closures, sheltered workshop employment closures, homemaker closures, and unsuccessful closures. The categories of variables used to differentiate client employment outcome included rehabilitation process, personal, financial, occupational, counselor related, and environmental factors.

The study was designed to achieve the following objectives:

1. Identify those factors in the rehabilitation service delivery system process that differentiate the unsuccessful closure from other employment outcomes.
2. Identify those factors or characteristics of the client, including those related to disability and to personal/biographical characteristics, that differentiate the unsuccessful closure from other employment outcomes.
3. Identify those factors related to the financial status of the client that differentiate the unsuccessful closure from other employment outcomes.
4. Identify those factors related to the occupational history of the

client that differentiate the unsuccessful closure from other employment outcomes.

5. Identify those factors related to the rehabilitation counselor that differentiate the unsuccessful closure from other employment outcomes.
6. Identify environmental factors that differentiate the unsuccessful closure from other employment outcomes.

METHOD

Subjects

Subject data for this investigation was obtained from the Blindness/Low Vision (BLV) Employment Database at Mississippi State University established and described in detail by Giesen et al. (1985). A summary description of the database is presented here.

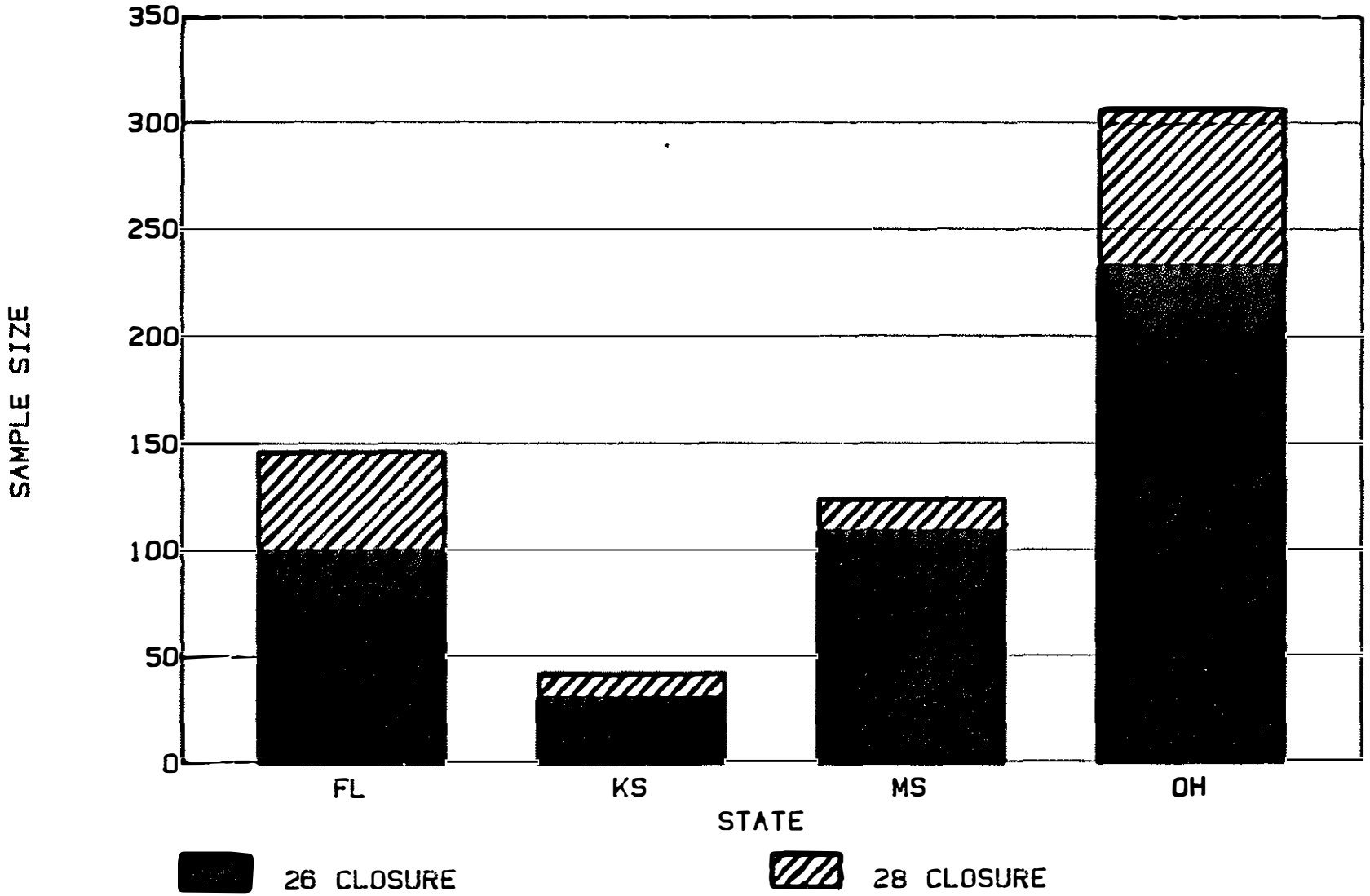
Case files of 619 legally blind or more severely visually impaired individuals (primary disability RSA code of 100-119) closed in status 26 (successful) and status 28 (unsuccessful) during federal fiscal years 1978 through 1980 (10/1/77 to 9/30/80) from the states of Florida, Kansas, Mississippi, and Ohio were reviewed. The states were strategically chosen to obtain a rural/urban representation, varied national geographic representation, state agency structure type representation, and state population size representation.

Systematic quota sampling resulted in the selection of every 17th case file from a master list of all cases closed in FYs 1978 through 1980, thus ensuring that the sampling would be distributed across the client population of each state. The sampling method resulted in each state being represented in proportion to the total served and to the successful/unsuccessful closure ratio for each state. Figure 1 shows the number of cases by closure status and state in the final sample. Of the 24% of the sample from Florida, there were 99 successful and 47 unsuccessful closure cases. In Kansas, with 7% of the sample, 30 cases were successful and 12 unsuccessful. Twenty percent of the sample came from Mississippi, with 108 successful and 16 unsuccessful closures. Ohio, with 50% of the sample, had 232 successful and 75 unsuccessful closures.

Variables in the Database

Based on literature reviews, case file previews, and identification of

FIG 1 TOTAL BLIND SAMPLE



previously unexplored variables, information abstracted directly from case files by a team of data collection specialists resulted in a kernel of 136 variables. Considerable information from the R-300 form or a similar form used by the state yielded 71 "R" variables. Case file information provided 32 "C" (case file) variables, including specific information on type and number of additional eye disabilities; type and number of other (noneye) disabilities; receipt of mobility training; use of adaptive aids; ability and achievement test scores; occupational history information; job titles; Dictionary of Occupational Titles (DOT) codes (U.S. Department of Labor, Bureau of Statistics, 1977); location and addresses of counselor and service facilities; and counselor demographic information, including training and experience. Several variables were coded by alternate coding systems. For example, each job title was coded by its DOT code and assigned a job difficulty index number, the Total Vocational Quotient (TVQ) (McCroskey, 1980). The DOT code was useful for descriptive purposes, while the TVQ index permitted inclusion of employment information in quantitative analysis. Also, 28 "E" variables (types of case service expenditures) were recorded.

For data analysis, display, internal validity, or exploratory purposes, a large number of new variables were created by recoding, regrouping, and arithmetic or logical transformations of the original variables. Many of these new variables were indicator variables. For example, R6, Referral Source, provided categorical information on sources of referral. Five new indicator variables (R6A, R6B, R6C, R6D, R6E) were computed from Referral Source. R6A indicated whether or not the client was referred by an individual; R6B, referred by an educational institution; and so on. At the time of this writing, the MSU Blindness/Low Vision Employment Database contains over 265 variables. Complete lists and other information on variables in the database

are available from the authors and in Giesen et al. (1985).

Variables from the database selected for examination in the present study are shown in Table 1, along with how the variables are coded and descriptions of special variables. Variables listed as possible "predictors" of outcome were those variables known at the time of referral, during the vocational rehabilitation process, or that reflected rehabilitation process activity, for example, expenditures for specific services. It was deemed inappropriate to employ variables which were not known until or near the time of closure to predict outcome, with the exception of service expenditure variables. Another restriction for selection of a predictor was that it have little, if any, missing data, since variables with substantial missing data may tend to show relationships that are restricted to particular subsets of the sample. Also, when the set of predictor variables is analyzed, the number of cases available for the variable with the smallest N is used to limit the number of cases on all other variables to this same minimum value. Variables listed as outcome descriptors were those variables which were not known until the time of closure and were descriptive of closure status. Other variables listed were typically frequency/categorical variables employed for description of the sample.

Variables with substantial missing data (e.g., Total Monthly Family Income at Referral) are indicated by ant"*" by the variable name and were excluded from the list of candidate predictors entered into the discriminant analysis.

Table 1: List of Variables

VARIABLE NAME	VARIABLE LABEL	(CODING)
	CANDIDATE PREDICTORS	
R6A	Referred by Individual	(a)
R6B	Referred by Educational Institution	(a)
R6C	Referred by Health Facilities	(a)
R6D	Referred by Welfare and Other	(a)
R6E	Referred by Private Organizations	(a)
R7	Age at Referral	
R9A	Gender	(a)
R11A	SSDI Received at Referral	(a)
R12A	SSI at Referral	(a)
R13A	White/Non-White	(a)
R15	Months in Statuses 00-02	
R16	Spanish Surname	(a)
R17	Referral Outcome - Extended Evaluation	(a)
R21A	Months Since Previous Successful Closure	
R21B	Months Since Previous Unsuccessful Closure	
R23A	Currently Married	(a)
R23B	Previously Married	(a)
R24	Number of Dependents	
R25	Total Number in Family	
R26	Highest Grade Completed	
R27B	Wage Earner Group at Referral	(b)
R28	Weekly Earnings at Referral	
R29*	Total Monthly Family Income at Referral	(c)
R31	Public Assistance Monthly Amount at Referral	
R32	Time on Public Assistance at Referral	(d)
R33B	Primary Support at Referral = Family-Friend	(a)
R33C	Primary Support at Referral = Transfer Payments	(a)

*Excluded due to extensive missing data

a Indicator, Yes/No variable, or dichotomous variable coded 1/0 for presence/absence of variable attribute.
b Coded into four groyps: (1) CPT (2) SHL (3) HMK (4) UNS.
c Coded 0 to 9 in $50 increments beginning with 0 if $0.00 - $149.99 through 9 if $600 and over.
d Coded 0 if not receiving public assistance, 1 if less than 6 months, 2 if 6 months or more but less than 1 year, 3 if 1 year or more but less than 2 years, and so on, through 7 if 5 years or more.

(continued)

Table 1 (continued): List of Variables

CANDIDATE PREDICTORS		
R33D	Primary Support at Referral = Other Sources	(a)
R36A	Referred by Social Security Administration	(a)
R37A	Social Security Recipient at Referral	(a)
R39	All Services - Total	
R40	Rehabilitation Facilities - Total $	
R41	Social Security Trust Fund - Total $	
R42	Supplemental Security Income Fund - Total $	
R52	Number of Months in Extended Evaluation	
R53	Number of Months from Acceptance to Closure	
R54	Number of Months in Training	
R55	Number of Months Ready or in Employment	
R58	Received Diagnostic Services	(a)
R59	Received Restoration Services	(a)
R60A	Received Institutional Training	(a)
R64A	Received Non-Institutional Training	(a)
R65	Received Personal and Vocational Adjustment Training	(a)
R67	Received Maintenance	(a)
R68	Received Other Services	(a)
R69	Received Services to Other Family Members	(a)
C1	Received SSDI During Service	(a)
C2	Age at Onset of Blindness	
C3	Visual Efficiency Percent Loss	
C4	Mobility Training	(a)
C5A	Used Optical Aid	(a)
C5B	Used Non-optical Aid	(a)
C5C	Used Both Optical and Non-optical Aids	(a)
C6	Low Vision Aid Training	(a)
C7A	Number of Types of Medications/ Treatments Prescribed	
C8*	IQ Measures	
C9*	Achievement WRAT Reading Level	
C91*	Achievement WRAT Spelling Level	
C92*	Achievement WRAT Arithmetic Level	
C11	Occupational Goal TVQ at First IWRP	
C12	Number of Changes in Occupational Goal	
C14	Previous Occupation 1 TVQ	
C15	Time from Previous Occupation to Referral	

(continued)

Table 1 (continued): List of Variables

CANDIDATE PREDICTORS	
C16	Previous Occupation First Time
C171*	Previous Occupation 2 TVQ
C1B	Previous Occupation Second Time
C191*	Previous Occupation 3 TVQ
C20	Previous Occupation Third Time
C22	Proximity to Nearest Vocational Rehabilitation Training Facility (miles)
C24	Proximity to Nearest Sheltered Employment
C26	Proximity to Vocational Rehabilitation Counselor (miles)
C27	Unemployment Rate County of Residence 2 Months Prior to Closure
C28	Counselor of Closure Years of Experience
C29	Counselor Training Index (e)
E10	Expenditure for Diagnostic Evaluation
E21	Expenditure for Surgery/Treatment
E21A	Expenditure Sum for Surgery/Treatment and Other Physical Restoration
E22	Expenditure for Prostheses
E23	Expenditure for Hospital/Convalescence
E24	Expenditure for Other Physical Restoration
E31	Expenditure for Academic Training-College
E31A	Expenditure Sum for Instruction (E31, 32, 33, 34, 37)
E32	Expenditure for Elementary or High School
E33	Expenditure for Business Training
E34	Expenditure for Trade School
E35	Expenditure for On-the-Job Training (OJT)
E35A	Expenditure Sumtof OJT and Miscellaneous Training
E36	Expenditure for Personal or Vocational Adjustment Training
E37	Expenditure for Technical Associate Degree
E38	Expenditure for Miscellaneous Training
E40	Expenditure for Maintenance
E50	Expenditure for Services to Family
E90	Expenditure for Other Services (miscellaneous)
E91	Expenditure for Travel/Transportation
E92	Expenditure for Reader Services

e Coded 10 if high school, 20 if BS or BA, 25 if BS/BA with CRC, 30 if BS in VR Services, 40 if masters, 45 if MA with CRC, 50 if MA in related area, 55 if MA in related area with CRC, 60 if MA in VR counseling, 65 if MA in VR counseling with CRC, 70 if doctorate.

(continued)

Table 1 (continued): List of Variables

CANDIDATE PREDICTORS		
E93	Other Expenditures Total	
R72C	Primary Disorder of Eyeball	(a)
R72D	Primary Disorder of Cornea & Sclera	(a)
R72E	Primary Disorder of Lens	(a)
R72F	Primary Disorder of Uveal Tract	(a)
R72G	Primary Disorder of Retina	(a)
R72H	Primary Disorder of Optic Nerve Pathway	(a)
R72I	Primary Disorder of Vitreous Humor	(a)
R72J	Primary Disorder of Eye Not Specified	(a)
NOCC	Number of Occupations	
NDIS	Number of Additional Disabilities (Nonvisual)	
TOTDIS	Total Number of Disabilities	
YDPR	Years Disabled Prior to Referral	
IPE	Index of Previous Employment	(f)
UR	Residency Rural or Urban	(a)
HEAIMP	Hearing Impairment Severity	(g)
SEVDIS2	Severe Secondary Disability Present	(a)
SEVDIS3	Severe Tertiary Disability Present	(a)
SDT	Total Number of Severe Nonvisual Disabilities	
TARGET OUTCOME VARIABLE		
R46B	Employment Outcome Group	(b)
OUTCOME DESCRIPTORS AND OTHER SELECTED DESCRIPTIVE VARIABLES		
R46	Work Status at Closure	
R47	Weekly Earnings at Closure	
R49	Public Assistance in Dollars at Closure	
R51	Occupation at Closure TVQ	
R57	Reason Not Rehabilitated	

f Index formed by multiplying the time the job was held by the TVQ (skill level) of the job summed over up to three previous jobs.

g Coded 0 if no hearing impairment, 1 if mild, 2 if moderate, 3 if severe, 4 if profound hearing loss.

(continued)

Table 1 (continued): List of Variables

OUTCOME DESCRIPTORS AND OTHER SELECTED DESCRIPTIVE VARIABLES	
R19A	Secondary Disability Groups (Nonvisual)
R20A	Tertiary Disability Groups (Nonvisual)
R23	Marital Status
R72A	First Eye Disorder Categories - ICD9
R73A	Second Eye Disorder Categories - ICD9
R74A	Third Eye Disorder Categories - ICD9

RESULTS AND DISCUSSION

Descriptive Findings for Employment Outcome Groups

Definitions

Outcome groups. The four outcome groups were established using wages earned and employment setting at case closure as criteria, following the recommendations of Giesen and Ford (1986) and Giesen et al. (1985). The four employment groups were competitive (CPT), sheltered (SHL), homemaker (HMK), and unsuccessful (UNS). The competitive group consisted of those employment outcomes for which wages were earned in nonsheltered settings.

The RSA outcome categories for the competitive group were competitive labor market, self-employed (except BEP), and state agency managed Business Enterprise Program. The sheltered group were employed in protected work settings. The sheltered group outcome category consisted of sheltered workshop closures. The homemaker group outcome categories were homemaker, unpaid family worker, and homebound industry closures. The unsuccessful group consisted of status 28 closures with outcome categories of not working - student, not working - other, and trainee or worker (noncompetitive labor market). This classification system is thus a regrouping of the nine group coding system used in the RSA manual for reporting vocational rehabilitation client work status at closure. While the nine group system provides more information about the outcome of the vocational rehabilitation process than the four employment group system of the present study, it is too cumbersome to facilitate prediction and interpretation of employment outcomes. The employment groups were assigned an index of 1 through 4, respectively, which reflects the earning potential of each of the groups. This index, therefore, permits quantitative analysis of the dependent variable, work status at closure. The four outcome group system has been shown to be an

efficient and effective system for furthering understanding of rehabilitation outcomes without being overly simplified or excessively segmented (see, e.g., Giesen & Ford, 1986; Schmitt, 1984/1985).

For convenience, the employment outcome groups will be referred to in the tables and in the remainder of this paper in the following manner:

Competitive group (CPT) = Group 1

Sheltered group (SHL) = Group 2

Homemaker group (HMK) = Group 3

Unsuccessful group (UNS) = Group 4

The sample of 619 blind and severely visually impaired persons had 469 (75.8%) of the cases closed in status 26 and 150 (24.2%) of the cases closed in status 28. Figure 2 displays the distribution of the sample across the employment outcome categories.

Table 2 shows the RSA work status closures. The tenth, homebound industry, was added to differentiate between self-employed, homebound, and sheltered workshop outcome statuses. Of the 202 persons closed in the competitive closure group, 82.7% (167) were closed in competitive employment, 11.4% (23) were closed as self-employed, and 5.9% (12) were closed in Business Enterprise (BEP) status. All 50 (100%) of the persons in the sheltered group were closed in sheltered employment. Of the 217 persons in the homemaker group, 197 (90.8%) were closed as homemakers, 3.2% (7) were closed as unpaid family workers, and the remaining 6.0% (13) were closed in homebound industry status. Of the 150 individuals in the unemployed outcome group, 3.3% (5) were closed in the student - not working status; 96% (144) were closed in the other - not working status; and 0.7% (1) were closed as trainee - noncompetitive labor market.

FIG 2: PERCENT IN EMPLOYMENT GROUPS

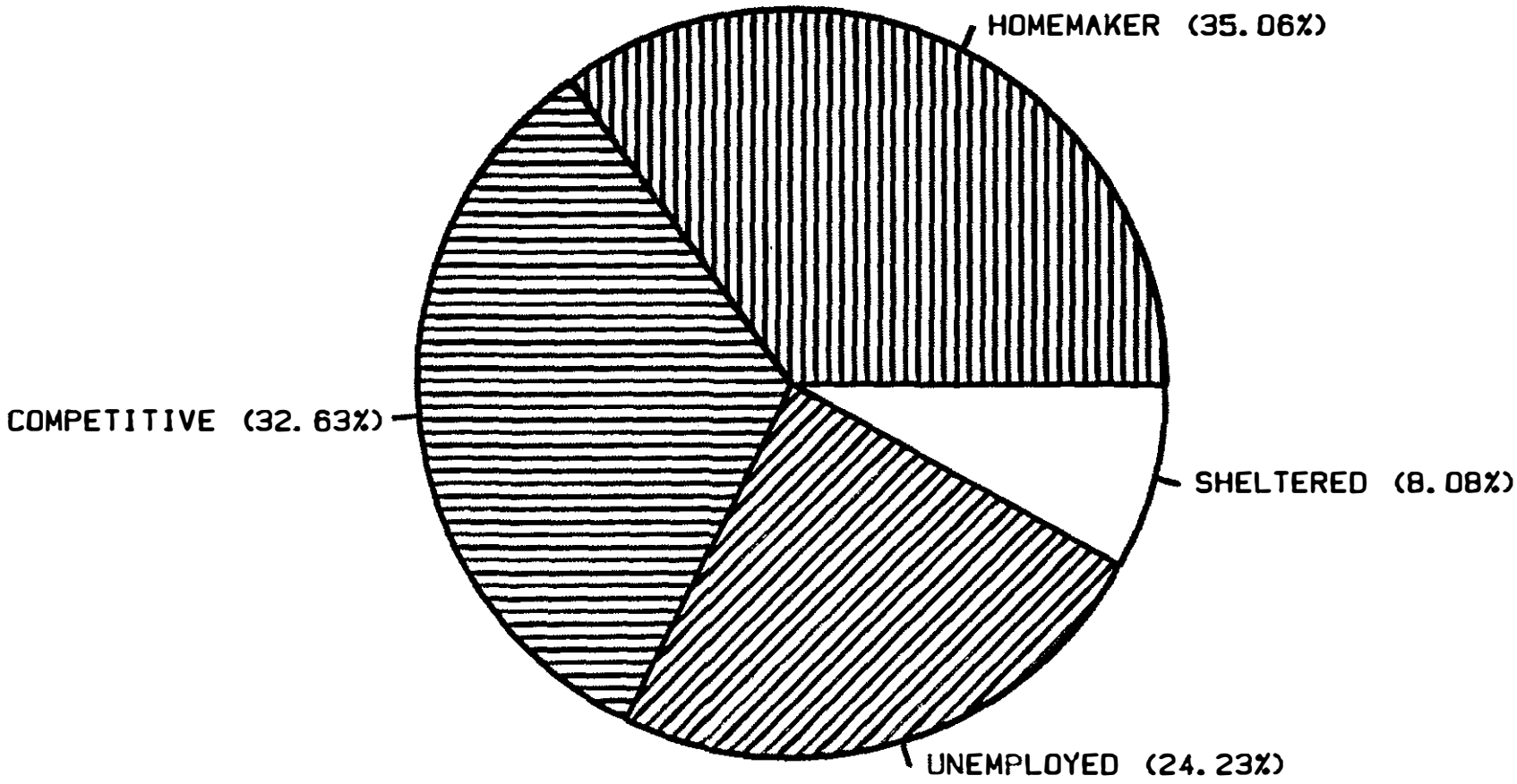


Table 2: Work Status and Employment Group*

WORK STATUS AT CLOSURE	EMPLOYMENT GROUP				TOT COUNT TOT PCT
	COMPETITIVE 1.	SHELTERED 2.	HOMEMAKER 3.	UNSUCCESSFUL 4.	
1. WAGE COMPETITIVE	167 100.0 82.7 27.0	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	167 27.0
2. WAGE SHELTERED	0 .0 .0 .0	50 100.0 100.0 8.1	0 .0 .0 .0	0 .0 .0 .0	50 8.1
3. SELF EMPLOYED	23 100.0 11.4 3.7	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	23 3.7
4. BEP OPERATOR	12 100.0 5.9 1.9	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	12 1.9
5. HOMEMAKER	0 .0 .0 .0	0 .0 .0 .0	197 100.0 90.8 31.8	0 .0 .0 .0	197 31.8
6. UNPAID FAMILY WORKER	0 .0 .0 .0	0 .0 .0 .0	7 100.0 3.2 1.1	0 .0 .0 .0	7 1.1
7. STUDENT NOT WORKING	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	5 100.0 3.3 .8	5 .8
8. OTHER NOT WORKING	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	144 100.0 96.0 23.3	144 23.3
9. TRAINEE	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	1 100.0 .7 .2	1 .2
10. HOMEBOUND INDUSTRY	0 .0 .0 .0	0 .0 .0 .0	13 100.0 6.0 2.1	0 .0 .0 .0	13 2.1
TOT COUNT TOT PCT	202 32.6	50 8.1	217 35.1	150 24.2	619 100.0

*Each cell contains the count, row percent, column percent, and total percent, respectively.

Reason not rehabilitated. Since the present study is focused on the unsuccessful 28 closure, the complete breakdown of reasons for 28 closure is given in Figure 3 and a logical grouping of the reasons for 28 closure is provided in Figure 4.

Over 75% (N = 469) of the sample was closed in competitive, sheltered, or homemaker closure groups. As shown in Figure 3, for the remaining 150 cases closed in the unsuccessful group, the most frequent reason given for 28 closure was client refusal of services (22.7% or 34), followed by failure to cooperate (20.0% or 30) and unable to locate (19.3% or 29). Other clients were not rehabilitated due to being too severely handicapped (17.3% or 26), death (10% or 15), transferred (6% or 9), or institutionalized (4.7% or 7).

Figure 4 displays the reasons for unsuccessful closure grouped as follows: unable to locate or transferred (25.3% or 38); severe handicap, institutionalized, or death (32.0% or 48); refused service or failed to cooperate (42.7% or 64).

The transferred case. The RSA Statistical Reporting System requires that a client transferred to another state agency be closed as an unsuccessful case (e.g., Ohio Rehabilitation Services Commission, Coding Aid for RSC-300, Revision 6/1979; State of Florida Department of Education, Division of Blind Services Vocational Rehabilitation Manual, Section 8.7, Revision 8/1982). Thus, the transferred case is defined as unsuccessful due to an artifact of the reporting system and not due to case performance. Indeed, the outcome of the unsuccessful-due-to-transfer case is not actually known. For these reasons, it might seem reasonable to exclude 28 closure transfer cases from analysis where such exclusion has a substantial effect on the results. Special attention was given to this issue in the data analysis, and it was found that the small number of UNS transfers were not significantly different from other types of UNS

FIG 3: REASON NOT REHABILITATED

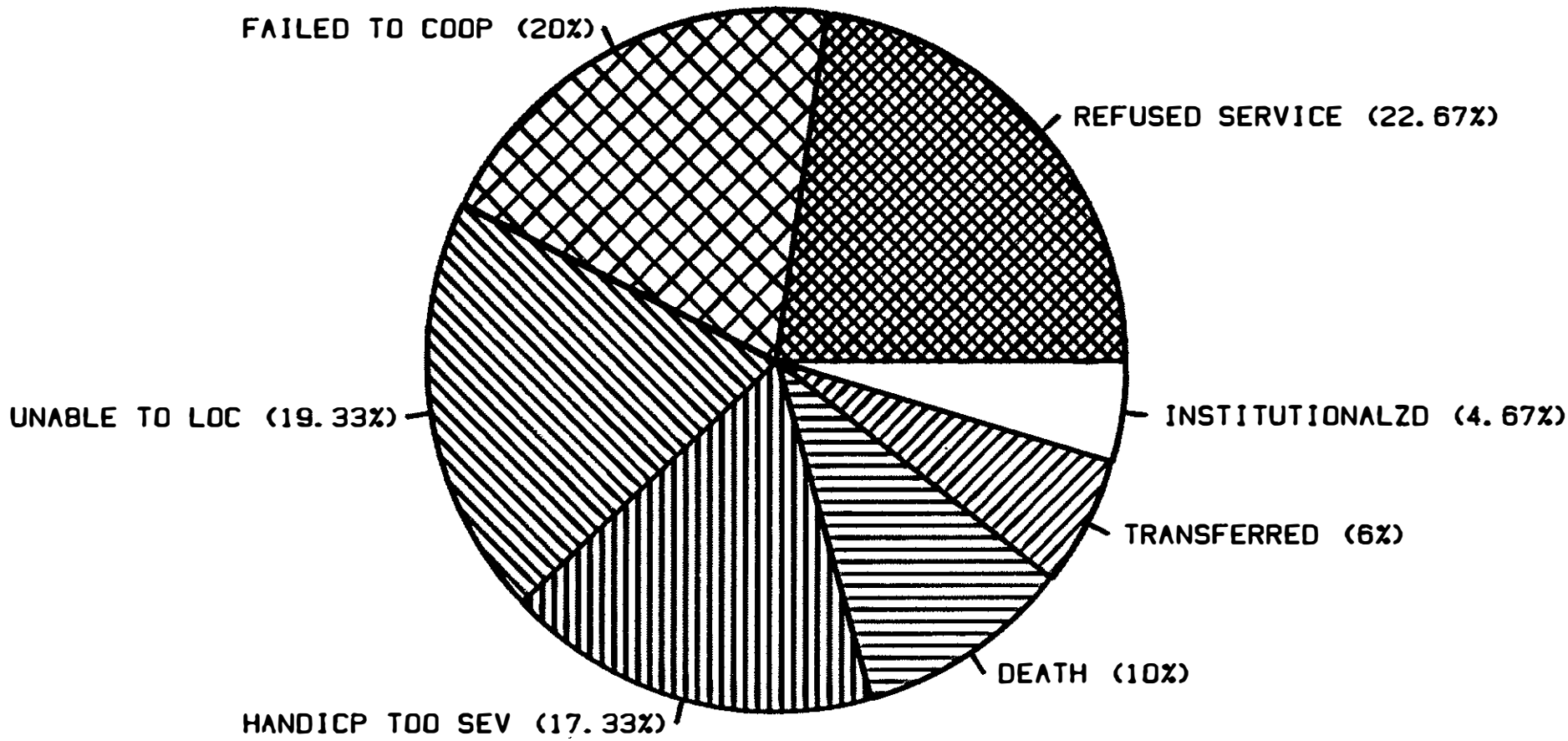
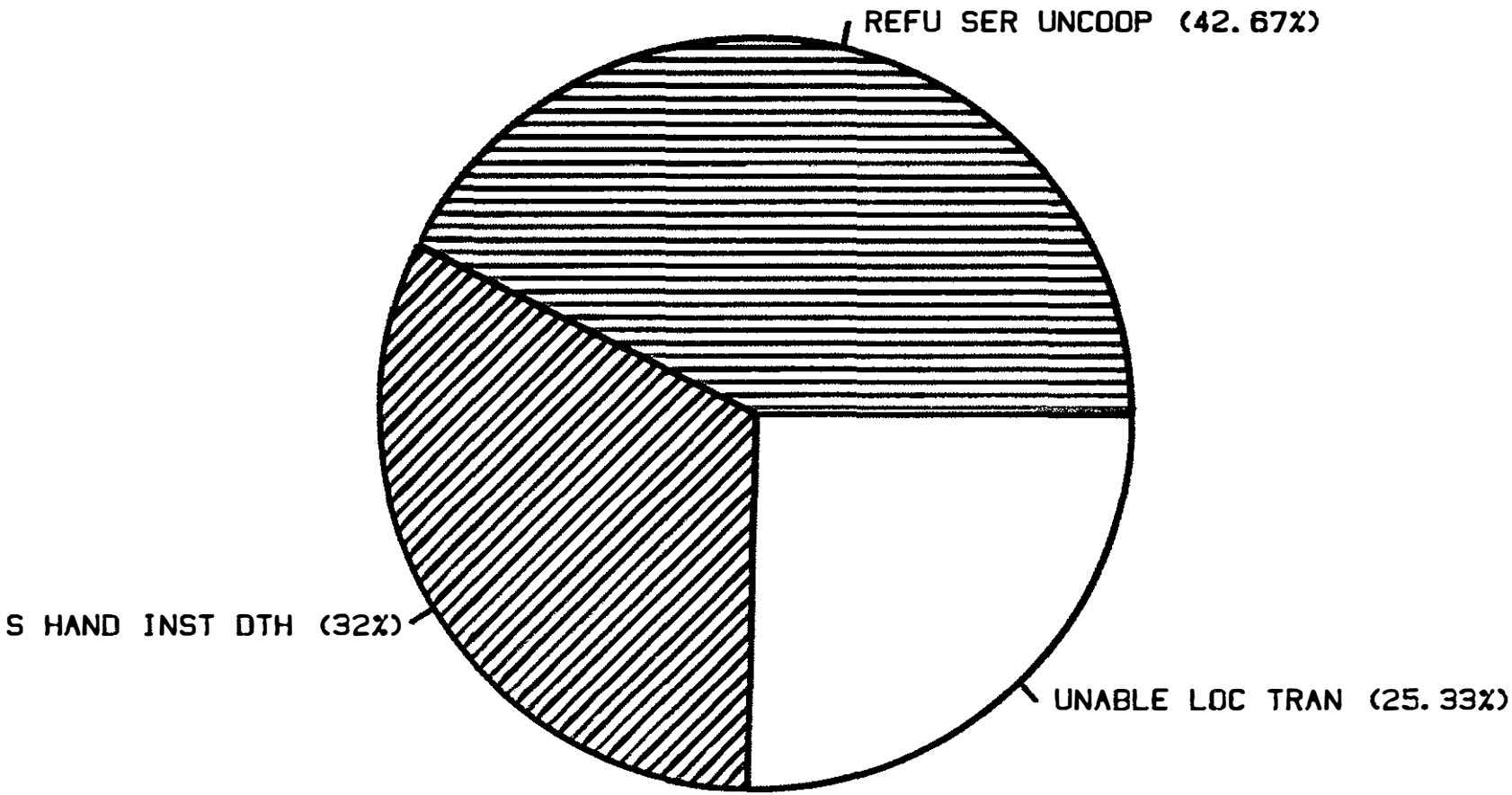


FIG 4: REASONS FOR UNSUCCESSFUL CLOSURE



closure clients. Thus, the transferred cases were included in the UNS group for all subsequent analyses.

Visual Impairment and Other Disability Characteristics

Visual impairment.

Of the 619 cases included in the study, 10.8% (67) of the subjects were blind in both eyes and had no light perception. The remaining 89.2% (552) were legally blind at referral, that is, with correction not less than 20/200 in the better eye or a field limitation within 20 degrees.

Figure 5 shows the number and proportions of the sample who were totally blind or legally blind at referral in each of the employment outcome groups. Of the 202 blind cases in the competitive group, 90.6% (183) were legally blind and 9.4% (19) were totally blind. With 50 persons closed in the sheltered group, 78% (39) were legally blind and the other 22% (11) were totally blind. The homemaker group had 92.2% (200) legally blind and 7.8% (17) totally blind.

The successful closure groups (CPT, SHL, HMK) combined had 90.0% (422) legally blind and 10.0% (47) who were totally blind. By contrast, the unemployed group had 86.7% (130) legally blind and 13.3% (20) who were totally blind.

Eye disorders.

To provide more specific eye disorder categorical data than could be obtained from the RSA coding system, the specific visual disorder diagnoses of each case in the BLV database were identified and classified according to The International Classification of Diseases, 9th Revision (ICD-9), Clinical Modifications (Commission on Professional and Hospital Activities, 1980). The major categories of visual diagnoses at referral were included in this study and appear in Tables 3, 4, 5. The specific diagnoses are displayed later by site and affection categories similar to the system used in National Society to Prevent Blindness publications (e.g., National Society to Prevent

FIG 5 BLINDNESS & OUTCOME

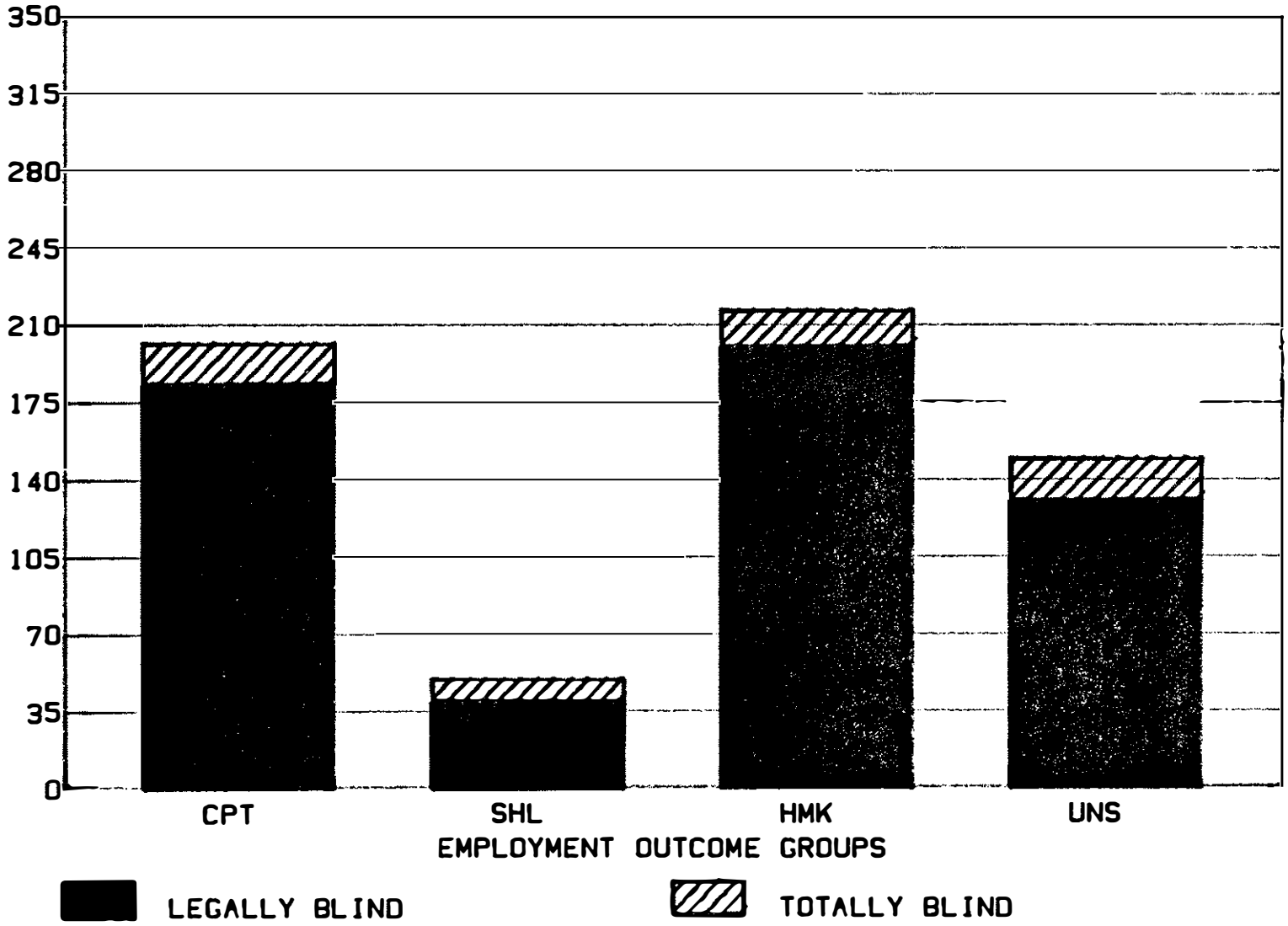


Table 3: Primary Eye Disorder Groups*

PRIMARY EYE DISORDER	EMPLOYMENT GROUP				TOT COUNT TOT PCT
	COMPETITIVE 1.	SHELTERED 2.	HOMEMAKER 3.	UNSUCCESSFUL 4.	
1. EYEBALL	39 37.9 19.3 6.3	10 9.7 20.0 1.6	31 30.1 14.3 5.0	23 22.3 15.3 3.7	103 16.6
2. CORNEA & SCLERA	15 44.1 7.4 2.4	1 2.9 2.0 .2	10 29.4 4.6 1.6	8 23.5 5.3 1.3	34 5.5
3. LENS	44 32.8 21.8 7.1	13 9.7 26.0 2.1	56 41.8 25.8 9.0	21 15.7 14.0 3.4	134 21.6
4. UVEAL TRACT	7 36.8 3.5 1.1	0 .0 .0 .0	8 42.1 3.7 1.3	4 21.1 2.7 .6	19 3.1
5. RETINA	58 26.7 28.7 9.4	13 6.0 26.0 2.1	88 40.6 40.6 14.2	58 26.7 38.7 9.4	217 35.1
6. OPTIC NERVE-PATHOLOGY	32 35.2 15.8 5.2	8 8.8 16.0 1.3	18 19.8 8.3 2.9	33 36.3 22.0 5.3	91 14.7
8. NOT SPECIFIED	7 33.3 3.5 1.1	5 23.8 10.0 .8	6 28.6 2.8 1.0	3 14.3 2.0 .5	21 3.4
TOT COUNT TOT PCT	202 32.6	50 8.1	217 35.1	150 24.2	619 100.0

*Each cell contains the count, row percent, column percent, and total percent respectively.

Table 4: Secondary Eye Disorder Groups*

SECONDARY EYE DISORDER	EMPLOYMENT GROUP				TOT COUNT TOT PCT
	COMPETITIVE 1.	SHELTERED 2.	HOMEMAKER 3.	UNSUCCESSFUL 4.	
NONE 0.	92 31.8 45.5 14.9	23 8.0 46.0 3.7	99 34.3 45.6 16.0	75 26.0 50.0 12.1	289 46.7
1. EYEBALL	23 31.9 11.4 3.7	6 8.3 12.0 1.0	22 30.6 10.1 3.6	21 29.2 14.0 3.4	72 11.6
2. CORNEA & SCLERA	10 52.6 5.0 1.6	2 10.5 4.0 .3	4 21.1 1.8 .6	3 15.8 2.0 .5	19 3.1
3. LENS	25 30.1 12.4 4.0	8 9.6 16.0 1.3	35 42.2 16.1 5.7	15 18.1 10.0 2.4	83 13.4
4. UVEAL TRACT	7 53.8 3.5 1.1	0 .0 .0 .0	4 30.8 1.8 .6	2 15.4 1.3 .3	13 2.1
5. RETINA	11 20.4 5.4 1.8	2 3.7 4.0 .3	23 42.6 10.6 3.7	18 33.3 12.0 2.9	54 8.7
6. OPTIC NERVE-PATHOLOGY	23 48.9 11.4 3.7	4 8.5 8.0 .6	9 19.1 4.1 1.5	11 23.4 7.3 1.8	47 7.6
7. VITREOUS	0 .0 .0 .0	0 .0 .0 .0	6 100.0 2.8 1.0	0 .0 .0 .0	6 1.0
8. NOT SPECIFIED	11 30.6 5.4 1.8	5 13.9 10.0 .8	15 41.7 6.9 2.4	5 13.9 3.3 .8	36 5.8
TOT COUNT TOT PCT	202 32.6	50 8.1	217 35.1	150 24.2	619 100.0

*Each cell contains the count, row percent, column percent, and total percent respectively.

Table 5: Tertiary Eye Disorder Groups*

TERTIARY EYE DISORDER	EMPLOYMENT GROUP				TOT COUNT TOT PCT
	COMPETITIVE 1.	SHELTERED 2.	HOMEMAKER 3.	UNSUCCESSFUL 4.	
NONE 0.	161 32.7 79.7 26.0	38 7.7 76.0 6.1	176 35.8 81.1 28.4	117 23.8 78.0 18.9	492 79.5
1. EYEBALL	9 33.3 4.5 1.5	3 11.1 6.0 .5	8 29.6 3.7 1.3	7 25.9 4.7 1.1	27 4.4
2. CORNEA & SCLERA	2 25.0 1.0 .3	0 .0 .0 .0	2 25.0 .9 .3	4 50.0 2.7 .6	8 1.3
3. LENS	5 16.1 2.5 .8	4 12.9 8.0 .6	16 51.6 7.4 2.6	6 19.4 4.0 1.0	31 5.0
4. UVEAL TRACT	1 33.3 .5 .2	0 .0 .0 .0	1 33.3 .5 .2	1 33.3 .7 .2	3 .5
5. RETINA	4 22.2 2.0 .6	2 11.1 4.0 .3	9 50.0 4.1 1.5	3 16.7 2.0 .5	18 2.9
6. OPTIC NERVE PATHOLOGY	11 59.7 5.4 1.8	2 10.5 4.0 .3	2 10.5 .9 .3	4 21.1 2.7 .6	19 3.1
7. VITREOUS	0 .0 .0 .0	0 .0 .0 .0	0 .0 .0 .0	2 100.0 1.3 .3	2 .3
8. NOT SPECIFIED	9 47.4 4.5 1.5	1 5.3 2.0 .2	3 15.8 1.4 .5	6 31.6 4.0 1.0	19 3.1
TOT COUNT TOT PCT	202 32.6	50 8.1	217 35.1	150 24.2	619 100.0

*Each cell contains the count, row percent, column percent, and total percent, respectively.

Blindness, 1980).

The BLV database contains up to three visual disabilities recorded from the eye care professional's report in each subject's case record. This information was included in this report. In those cases where more than one eye condition was listed, the first visual impairment reported as the diagnosis by the eye care professional was recorded as the subject's first visual impairment, the second visual impairment listed was recorded as the second, and the third diagnosis of a visual disability reported was recorded as the third eye condition. It was found that 53.3% (330) of the subjects were reported as having two visual disorders, and 20.5% (127) were reported as having three visual disorders. For the UNS outcome group, 50% had two visual disorders and 22% had three visual disorders.

Overall, the most frequently reported first eye disorder group was retinal disorders (35.1%), the second most frequent was lens disorders (21.6%), and the third most frequent was eyeball disorders (16.6%). For the UNS group, the most frequently reported first eye disorder group was retinal disorders (38.7%), followed by optic nerve pathologies (22%), and eyeball disorders (15.3%). Tables 3, 4, and 5 show the distribution of the first, second, and third visual impairment by site and affection category across the employment outcome groups.

The most frequently reported second eye disorder group was lens disorders (13.4%), followed by eyeball disorders (11.6%), followed by retinal disorders (8.7%). For the UNS group, the first three most frequently reported second eye disorder groups were eyeball disorders (14%), retinal disorders (12%), and lens disorders (10%).

The three most frequently recorded third eye disorders were lens disorders (5%), eyeball disorders (4.4%), and optic nerve pathologies and unspecified

disorders tied at 3.1%. For the UNS group, the three most frequently reported third eye disorder groups were eyeball disorders (4.7%), lens disorders and unspecified disorders tied at 4%; and disorders of the cornea and sclera, and optic nerve pathologies tied at 2.7%.

Table 6 shows a comparison of the percentage of visual disorders of the successful closure cases and the unsuccessful 28 closure cases sampled to the 1978 National Society to Prevent Blindness legally blind site and type of affection data (National Society to Prevent Blindness, 1980). The mean number of visual diagnoses per case was 1.74 for the successful and 1.72 for the unsuccessful closure cases, which indicates that these two groups were equally likely to have multiple eye affections. Among the unsuccessful closures, retinal disorders were the most frequently recorded eye disorders, followed by eyeball disorders. The leading cause of blindness was diabetic retinopathy (9.7%). The second most frequent cause of blindness for this group was optic nerve atrophy (9.3%), followed by "other" cataracts (8.5%).

Among the successful closures, retinal disorders were the most frequently recorded eye disorders, followed by lens disorders. The leading cause of blindness for these successful closure groups was "other" cataract disorders (13.2%). The second most frequent cause of blindness was the category of undetermined and unspecified disorders (7.6%), followed diabetic retinopathy (7.5%).

Other disabilities. The sample data was reviewed to discern whether the subjects had disabilities other than visual. The examination revealed that 69.1% of the sample were found to have a second (at least one nonvisual) disability. The HMK group had the largest proportion of secondary nonvisual disabilities (84.3%), the UNS group was next (74%), followed by the SHL group (68%) and the CPT group (49.5%). It was also found that a tertiary disability

Table 6: Affections of Successful and Unsuccessful Compared with a 1978 General Blind Sample

SITE AND TYPE OF AFFECTION	MSU BLV DATABASE		NSPB
	Successful	Unsuccessful	
	%	%	%
Eyeball	18.4	19.9	22.8
Globe Disorders	3.4	4.7	N/R
Myopia	2.3	3.1	4.0
Hypermetropia	.2		N/R
Astigmatism	1.5	.4	N/R
Presbyopia	.1	.4	N/R
Glaucoma Adult Onset	5.5	6.2	13.5
Albinism	1.1		1.4
Anophthalmos, Microophthalmos	1.0	.4	N/R
Other Eyeball	3.3	4.7	3.9
Cornea and Sclera	5.6	5.8	5.0
Keratitis	1.0	.8	2.0
Other	4.6	5.0	3.0
Lens	25.2	16.3	14.4
Cataract	19.3	11.2	13.8
Prenatal	5.6	2.3	2.6
Senile	.5	.4	8.3
Other	13.2	8.5	2.9
Aphakia	5.5	3.9	
Misc. Lens	.4	1.2	.6
Uveal Tract	3.4	2.7	6.1
Chorioretinitis	2.7	1.9	2.7
Uveitis	.6	.4	2.3
Other	.1	.4	1.1
Retina	25.7	30.7	30.9
Detachment of Retina	2.0	3.1	1.7
Macular Degeneration	4.4	3.5	11.7
Retinitis Pigmentosa	3.5	3.1	4.7
Diabetic Retinopathy	7.5	9.7	6.6
Other Retinopathy	3.3	4.7	1.7
Other Retinal Disorders	5.0	6.6	4.5
Optic Nerve and Optic Pathway	13.3	18.6	11.4
Optic Nerve Atrophy	5.5	9.3	7.0
Optic Neuritis	.5	.4	1.6
Nystagmus	6.0	6.2	1.3
Other Optic Nerve	1.3	2.7	1.5
Vitreous	.7	.8	.2
Vitreous Body Disorders	.7	.8	.2
Multiple Affections	*	*	5.4
Undetermined and Not Specified	7.6	5.4	3.8

NOTE: N/R = not reported by NSPB.
* = Multiple affections were not tabulated for this table.

(second nonvisual disability) was present for 38.3% of the subjects. The group with the largest proportion of third disabilities was the HMK group (49.3%), followed by the UNS group (46.7%). Smaller proportions were reported for the SHL group (32%) and the CPT group (21.8%).

The most frequently reported nonvisual disability (second disability) for the sample was diabetes mellitus in 18.4% of the cases. Cardiovascular disease (mostly hypertension) was the most frequently recorded tertiary disability (12.9%). Tables 7 and 8 show the three most prevalent secondary and tertiary disability groups for each of the employment outcome groups.

Selected Descriptors of the Employment Outcome Groups

The following presentation is intended as an overview of selected characteristics associated with each of the outcome closure groups prior to the presentation of the discriminant function analysis results. Descriptive statistics on the characteristics of the outcome groups for other variables in the BLV database may be obtained by request from the MSU RRTC. See Table 9 for means and standard deviations for selected variables.

Age at referral. The youngest group was the sheltered group (M = 31.98 years). The oldest group was the homemaker group (M = 56.04). The mean age of subjects closed in the competitive group was 34.81 years. The clients closed in the unsuccessful group had a mean age of 39.91 years.

Gender. Of the entire sample of 619 clients, 52.2% (323) were females. A higher percentage of the competitive group were males (59.4% or 120). The sheltered group consisted of 64.0% males (32). The largest percentage of females (73.7% or 160) was found in the homemaker group. The unsuccessful group had a larger percentage of males at 58.0% (87). (See Figure 6.)

Marital status. Of the total subject population, most of the clients were classified as either married (36.8% or 228) or never married (36.3% or 225).

Table 7: Three Most Prevalent Secondary Disability Groups

None	50.5	None	32.0
Cardiovascular Disease	12.9	Mental Retardation	20.0
Diabetes Mellitus	8.4	Orthopedic Impairment	12.0
Alcoholism and Personality Disorders	5.9	Hearing Impairment and Cardiovascular Disease	8.0
HOMEMAKER GROUP (N=217)	%	**UNEMPLOYED GROUP (N=150)**	**%**
None	15.7	**None**	**26.0**
Diabetes Mellitus	29.5	**Diabetes Mellitus**	**22.0**
Cardiovascular Disease	18.9	**Alcoholism and Personality Disorders**	**11.3**
Orthopedic Impairment	12.9	**Orthopedic Impairment**	**10.0**

Table 8: Three Most Prevalent Tertiary Disability Groups

COMPETITIVE (N=202)	%	SHELTERED (N=50)	%
None	78.2	None	68.0
Cardiovascular Disease	4.5	Mental Retardation	8.0
Orthopedic Impairment	4.5	Hearing Impairment	6.0
Two tied at	2.0	Cardiovascular Disease	6.0
HOMEMAKER (N=217)	%	**UNEMPLOYED (N=150)**	**%**
None	50.7	**None**	**53.3**
Cardiovascular Disease	20.7	**Cardiovascular Disease**	**15.3**
Orthopedic Impairment	7.4	**Genitourinary Conditions**	**5.3**
Allergic Disorders	3.7	**Orthopedic Impairment**	**4.7**

Table 9: Summary Means, Standard Deviations, and Valid N for Selected Variables for Elderly Blind Sample

OUTCOME GROUP	Age at Referral	Months in Statuses 00-02	Months Since Previous Closure	No. of Dependents	Total No. in Family
COMPETITIVE					
Mean	34.81	2.73	18.70	.79	2.75
St Dev	16.58	4.58	16.03	1.32	1.80
Valid N	202	202	30	202	202
SHELTERED					
Mean	31.98	2.90	16.36	.68	3.10
St Dev	14.62	4.77	11.33	1.15	1.68
Valid N	50	50	11	50	50
HOMEMAKER					
Mean	56.04	2.41	15.56	.66	2.35
St Dev	16.40	4.34	9.99	1.19	1.58
Valid N	217	217	16	217	217
UNEMPLOYED					
Mean	39.91	2.57	12.29	.67	2.65
St Dev	19.62	3.93	9.52	1.30	1.84
Valid N	150	150	17	150	150

OUTCOME GROUP	Highest Grade Completed	Weekly Earnings at Referral	Total Mo. Family Income at Referral**	Public Assist. Mo. Amt.. at Ref.	Time On Public Asst. at Ref. **
COMPETITIVE					
Mean	11.25	32.35	4.71	37.95	.75
St Dev	3.47	76.61	3.71	78.43	1.71
Valid N	202	202	184	20	201
SHELTERED					
Mean	7.80	7.68	3.93	45.06	1.28
St Dev	4.30	28.93	3.48	72.55	2.26
Valid N	50	50	45	50	50
HOMEMAKER					
Mean	9.58	5.48	4.65	22.70	.68
St Dev	3.50	33.60	3.19	55.31	1.81
Valid N	217	217	195	217	214
UNEMPLOYED					
Mean	10.47	12.23	4.17	48.44	1.19
St Dev	3.50	42.47	3.34	102.70	2.19
Valid N	150	150	137	150	149

(continued)

Table 9 (continued): Summary Means, Standard Deviations, and Valid N for Selected Variables for Elderly Blind Sample

OUTCOME GROUP	All Services Total	Rehab. Facil. Total	S.S. Trust Fund Total	Supp. Sec. Income Fund Total	Week. Earn. at Clos.
COMPETITIVE					
Mean	3249.09	767.05	187.77	466.06	130.94
St Dev	4156.83	1845.62	826.57	1527.68	86.81
Valid N	202	202	202	202	202
SHELTERED					
Mean	4351.32	2495.14	102.86	413.14	66.14
St Dev	6504.76	4269.78	386.74	1158.24	46.48
Valid N	50	50	50	50	50
HOMEMAKER					
Mean	1462.28	762.69	89.14	250.94	0.24
St Dev	2276.22	2133.60	806.56	2833.42	1.40
Valid N	217	217	217	217	216
UNEMPLOYED					
Mean	2841.95	889.07	154.02	571.55	2.79
St Dev	5065.29	2475.58	798.79	2434.32	16.70
Valid N	150	150	150	150	150

OUTCOME GROUP	Pub. Asst. Amt. in $ at Closure	Occupations at Closure TVQ	No. of Mos. in Extend. Evaluation	No. Mos. from Accept to Closure
COMPETITIVE				
Mean	34.40	61.16	.84	24.52
St Dev	92.58	13.36	3.75	26.25
Valid N	202	202	202	202
SHELTERED				
Mean	57.72	48.12	1.28	23.14
St Dev	81.01	6.73	3.51	27.73
Valid N	50	50	50	50
HOMEMAKER				
Mean	28.00	49.76	.56	14.16
St Dev	76.62	1.67	2.49	13.56
Valid N	217	217	217	217
UNEMPLOYED				
Mean	48.77	52.20	.98	24.05
St Dev	83.15	14.35	4.10	24.99
Valid N	150	10	150	150

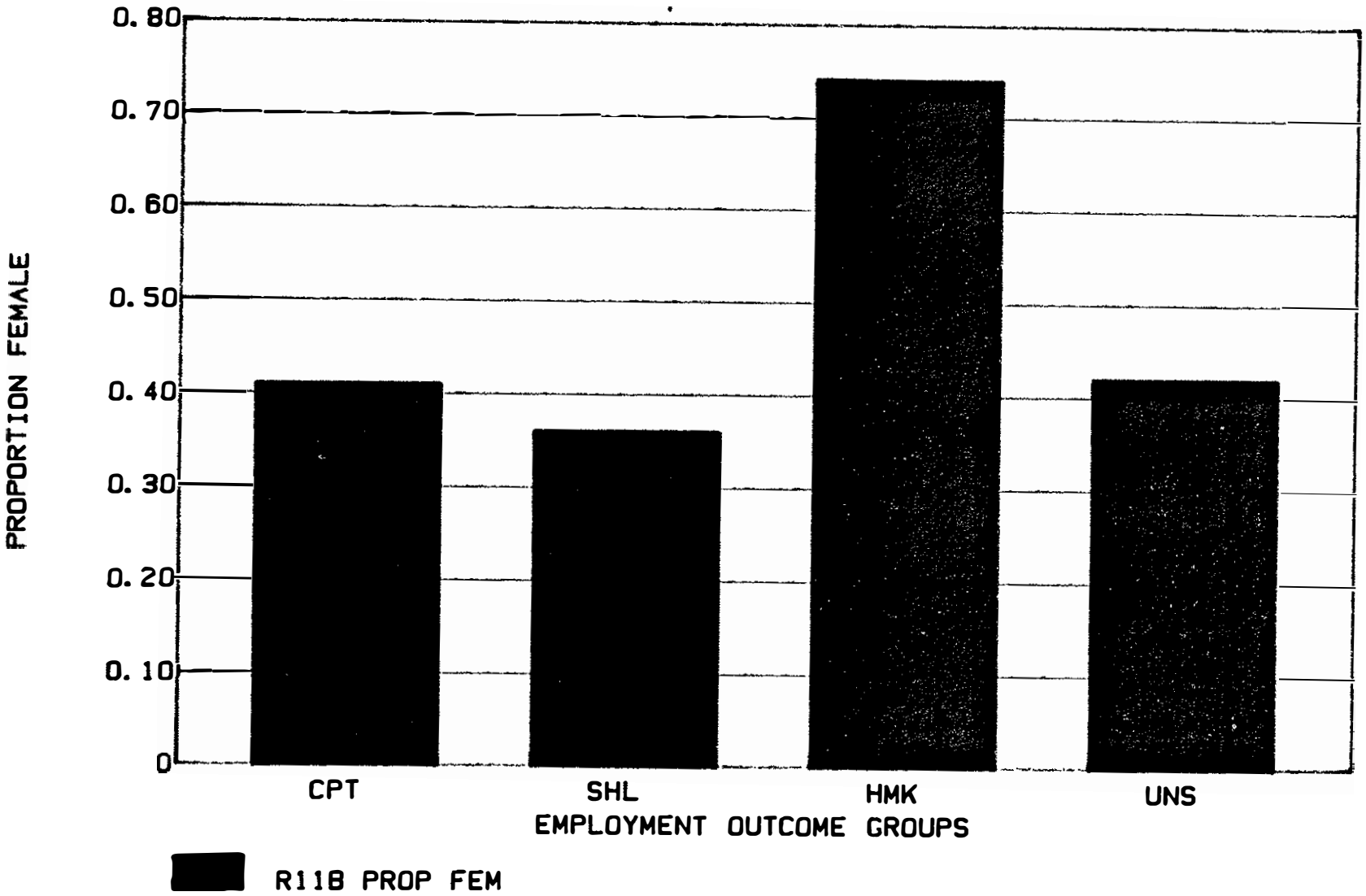
(continued)

Table 9 (continued): Summary Means, Standard Deviations, and Valid N for Selected Variables for Elderly Blind Sample

OUTCOME GROUP	No. Mos. in Training	No. Mos. Ready or in Emp.	Age at Onset of Blindness	Vis. Eff. % Loss	No. of Types of Med. Treats.
COMPETITIVE					
Mean	13.69	4.26	19.18	92.93	0.46
St Dev	21.99	5.06	21.13	5.96	.66
Valid N	202	202	202	202	202
SHELTERED					
Mean	13.66	3.74	12.32	94.18	.68
St Dev	24.91	5.49	16.62	6.82	.82
Valid N	50	50	50	50	50
HOMEMAKER					
Mean	4.00	2.56	45.82	93.06	.84
St Dev	6.17	4.25	22.75	6.07	.78
Valid N	217	217	217	217	217
UNEMPLOYED					
Mean	10.71	2.38	28.18	94.44	.57
St Dev	14.40	6.66	24.21	5.74	.84
Valid N	150	150	150	150	150

** Coded variable.

FIG 6: GENDER


0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0
PROPORTION FEMALE
CPT
SHL
HMK
UNS
EMPLOYMENT OUTCOME GROUPS
R11B PROP FEM

Smaller percentages were found among the other marital statuses: widowed (14.9%), divorced (7.9%), and separated (4%). The largest percentage of the competitive closures was never married (51% or 103), followed by married (29.7% or 60). The clients in the sheltered group were classified mostly as never married (66.0% or 33) and married (24% or 12). In the homemaker group, the highest percentage was married (49.8% or 108), followed by widowed (27.6% or 60). The major portion of the unsuccessful group was never married (41.3% or 62) and married (32.0% or 48).

Highest grade completed at referral. The highest level of education was achieved by the competitive group with a mean grade level of 11.3, followed by the unsuccessful group with a mean grade of 10.5. The lowest grade level was reported for the sheltered closure group at a mean of 7.8. The mean grade level of the homemaker group was 9.6. (See Table 9.)

Weekly earnings at referral. The average weekly earnings of the clients closed in the competitive group were $32.35. The mean earnings for the sheltered group were $7.68. The subjects in the homemaker group had average weekly earnings at referral of $5.48 and the unsuccessful group averaged $12.23. (See Table 9.)

Weekly earnings at closure. A wide variation in earnings was found for the competitive and the sheltered groups. The average earnings for the competitive group were $130.94, and the sheltered group had average closure earnings of $66.14. The closure earnings for the homemaker group were $0.24, and for the unsuccessful group the weekly closure earnings were $2.79. (See Table 9.)

Occupation at closure TVQ. In order to assign an index of job difficulty to the job or position in which the case was closed, the total raw score vocational quotient (TVQ) was used. The TVQ is an index of job difficulty for each of 12,099 jobs defined in the Dictionary of Occupational Titles (U.S.

Department of Labor, 1977). The TVQ was developed by McCrosky and reported in McCrosky (1980) and McCrosky and Perkins (1981). The mean TVQ score of the 12,099 jobs defined in the Dictionary of Occupational Titles is 57.2 (SDt= 14.5) with a range of 30 to 107. The job with the lowest TVQ is wire cutter (DOT numbert= 731.687038); the job with the highest TVQ is internist (DOT numbert= 070.101042) (McCrosky, 1980).

During the data collection process, TVQ scores were assigned to each job or position held by the subject. For example, a case closed competitively employed as a beautician (DOT numbert= 332.271010) has a TVQ score of 72. Subjects closed as homemakers were assigned a TVQ of 50, the value associated with DOT code 310.470010: House worker, general. Persons closed in jobs in sheltered workshops were given the TVQ score appropriate for the job title. For example, a person with the job of hand packer in a sheltered workshop was assigned the DOT number 920.587018 with a TVQ score of 42. Persons closed unemployed were not assigned a DOT number or a TVQ score.

The mean TVQ score for the subjects in the competitive group was 61.2. The sheltered group had a mean TVQ score of 48.1 and the homemaker group had a mean TVQ of 49.8. (The homemaker group included some homebound industry cases with a TVQ less than 50.0.) There was no meaningful average TVQ for the unsuccessfully closed group. (See Table 9.)

Other selected variables. Means and standard deviations are presented in Table 9 for several other selected variables not discussed in the text. These variables are months in statuses 00-02 (R15), months in referral and application; months since previous closure (R22); number of dependents (R24); total number in family (R25); total monthly family income at referral (R29), coded 0 to 9 in $50 increments beginning with 0 if $0.00 - $149.99 to 9 if $600 and over; public assistance monthly amount at referral (R31); time on

public assistance at referral (R32), coded 0 if not receiving public assistance, 1 if less than 6 months, 2 if 6 months but less than 1 year, 3 if 1 year but less than 2 years, and so on to 7 if 5 years or more; all services total (R39) in dollars; rehabilitation facilities (expenditure) total (R40); Social Security Trust Fund (R41) total; Supplemental Security Income Fund total (R42); public assistance amount at closure (R49); number of months in extended evaluation (R52); number of months from acceptance to closure (R53); number of months in training (R54); number of months ready or in employment (R55); age at onset of blindness (C2); visual efficiency percent loss (C3); number of types of medications and treatments (C7A).

Discriminant Analysis and Classification

Overview

Multiple discriminant analysis was the primary statistical procedure employed in this investigation. The application of discriminant analysis has three major stages (Hair, Anderson, Tatham, & Grablowsky, 1984). The first stage, derivation, involves establishing whether or not statistically significant functions can be derived to separate the four employment outcome groups. The second stage, validation, concerns examination of the classification matrix and evaluation of the predictive accuracy produced by the discriminant functions. The third stage, interpretation, seeks to determine which of the independent variables contribute most in separating the groups.

Derivation Stage

Variable selection. The dependent variable was Employment Outcome Group (CPT, SHL, HMK, UNS), and the independent variables considered are given in Table 1.

Computational method. Stepwise multiple discriminant analysis was employed to identify specific variables which discriminate or help classify cases into outcome groups using the information contained in the independent variables. The discriminant analyses were performed by the DISCRIMINANT procedure in Release 9.0-UW2.0 of the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). The Wilks' method was used, and prior probabilities were determined by group size.

In the stepwise discriminant procedure, variables enter the equation based on their ability to discriminate among the outcome groups. The first variable entered is the best single discriminating variable. The second variable entered is the variable which produces the largest increase in discrimination given that the first variable entered is already in the equation, and so on. The significance levels for the F-to-enter/F-to-remove selection criteria were PIN=0.05/POUT=0.10 for the discriminant analysis results which follow, unless otherwise specified. [See Giesen and Ford (1986) for a discussion of the effects of the entry criterion on the discriminant analysis.t]

Preliminary Analyses

Previous research (e.g., Giesen & Ford, 1986; Giesen et al., 1985) has shown the advantages of and the necessity for division of employment outcomes of the vocational rehabilitation process into four outcome groups: CPT, SHL, HMK, and UNS. Previous research which has combined CPT, SHL, and HMK successful closures into one group probably has obscured important differences among these types of successful closures and obfuscated differences between each

of the types of successful closure and unsuccessful 28 closures. To examine this issue in the present investigation, several preliminary discriminant analyses were performed. These analyses were examined in terms of the classification matrix and percent of cases correctly classified, which is analogous to the concept of R-squared in multiple regression analysis and subject to similar interpretation (Hair et al., 1984, p. 97).

First, a two-group discriminant analysis was conducted with the three successful closure groups combined vs. the unsuccessful group as the independent variable. The classification results of this analysis are shown in Table 10. There was 76.7% correct classification overall for this analysis. However, while there was a 97.9% correct classification of the successful closure cases that were predicted to be successful, there was only a 10.7% correct classification (16 out of 150) of the unsuccessful closure cases that were predicted to be unsuccessful. This figure was improved slightly to 14.2% when unsuccessful transfer cases were excluded from the analysis. Since this investigation has as its focus factors associated with, or "predictive" of, the unsuccessful 28 closure, the rate of correct prediction of the unsuccessful cases which were actually unsuccessful was considered to be of primary importance. The classification rates of 10% to 14% were unacceptably low considering the goals of this study.

Next, a four group discriminant analysis was conducted among the three successful closure groups and the unsuccessful group, similar to that conducted and reported by Giesen et al. (1985), except that a more stringent stepwise inclusion criteria (PIN=0.05/POUT=0.10) was employed. The classification results of this analysis are shown in Table 11. Again, the overall correct classification rate of 62.7% is respectable, but the correct classification of the actual unsuccessful cases who were predicted to be

Table 10: Classification Results for the Discriminant Analysis of Unsuccessful vs. Successful Closures

ACTUAL GROUP	NUMBER OF CASES	PREDICTED GROUP MEMBERSHIP	
		"26" Group 3	"28" Group 4
GROUP 3 SUCCESSFUL "26"	469	459 97.9%	10 2.1%
GROUP 4 UNSUCCESSFUL "28"	150	134 89.3%	16 10.7%
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 76.74%			

Table 11: Classification Results of the Discriminant Analysis of the Four Outcome Groups

ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP			
		CPT 1	SHL 2	HMK 3	UNS 4
GROUP 1 COMPETITIVE	202	149 73.8%	7 3.5%	30 14.9%	16 7.9%
GROUP 2 SHELTERED	50	14 28.0%	19 38.0%	7 14.0%	10 20.0%
GROUP 3 HOMEMAKER	217	14 6.5%	4 1.8%	174 80.2%	25 11.5%
GROUP 4 UNSUCCESSFUL	150	54 36.0%	5 3.3%	45 30.0%	46 30.7%
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 62.68%					

unsuccessful more than doubled to 30.7% (46 out of 150) (32.6% if UNS transfers were excluded).

This analysis, when contrasted with the previous two-group analysis, shows an impressive improvement in discrimination of the UNS group, SIMPLY BY SEPARATING THE SUCCESSFUL CLOSURE CASES INTO THE CPT, SHL, AND HMK GROUPS. The successful closure cases are themselves heterogeneous, and allowing for separate groupings among the successful closures enables much better classification of the UNS group. Therefore, the three successful closure groups were kept separate and contrasted individually with the unsuccessful group to determine which factors specifically differentiated each successful closure group from the unsuccessful group in the primary analyses to follow.

Primary Discriminant Analyses

Based on the results from the preliminary analyses, three two-group discriminant analyses were conducted which contrasted the UNS group with each of the three successful closure groups: CPT, SHL, and HMK. The results for each of these analyses are presented consecutively for each stage of the explication of the discriminant analysis procedure.

Discriminant functions. The results of the three discriminant analyses for the three comparisons yielded an eigenvalue and a set of coefficients for each analysis as shown in Table 12. Each of the discriminant functions derived for each of the three comparisons yielded a Wilks' lambda (or U statistic), a multivariate measure of group differences (Klecka, 1980, pp. 38-39) for which a significant Chi-Square value was obtained. This indicated significant separation between the centroids for each of the three analyses.

Validation of discriminant functions. Discriminant analysis is employed as a statistical technique because it can provide information regarding classification of cases into outcome groups using the discriminating variables.

Table 12: Discriminant Function Summaries

UNSUCCESSFUL - COMPETITIVE ANALYSIS						
Function	Eigen-value	Canonical Correlation	After Function	Wilks' Lambda	df	Chi Square
-	-	-	0	.727	12	108.2*
1	.375	.522				

UNSUCCESSFUL - SHELTERED ANALYSIS						
Function	Eigen-value	Canonical Correlation	After Function	Wilks' Lambda	df	Chi Square
-	-	-	0	.575	12	104.1*
1	.740	.653				

HOMEMAKER - UNSUCCESSFUL ANALYSIS						
Function	Eigen-value	Canonical Correlation	After Function	Wilks' Lambda	df	Chi Square
-	-	-	0	.610	12	173.8*
1	.638	.624				

* $p \leq .001$

The percent of cases correctly classified in discriminant analysis is analogous to the concept of R-squared in regression analysis and is subject to a similar interpretation (Hair et al., 1984, p. 97). Tables 13, 14, and 15 present the classification results for each of the discriminant analyses. In each of these tables, the first box shows the classification results based on the primary discriminant function computed on the total sample.

Sample division and cross-validation considerations. For cross-validation purposes, another set of analyses were conducted based on an approximate 75% vs. 25% random sample of cases. The 75% "analysis" sample was used to derive a cross-validation discriminant function, and the 25% "hold-out" sample was used to test the classification accuracy of this discriminant function on a sample other than the one on which the function was derived. The sample was divided in this manner since an upward bias tends to occur in the prediction accuracy of the discriminant function when the same cases used to derive the function are subsequently used to test the classification accuracy of the discriminant function (Hair et al., 1984). Thus, the results for classification accuracy given in box three of Tables 13, 14, and 15 are probably better estimates of the classification accuracy attainable if the primary discriminant function results were applied to classification of new cases.

Classification accuracy. To evaluate the predictive accuracy of the discriminant function it must be compared to the percentage of correct classification occurring by chance, or without the assistance of the discriminant function. Since the two groups in each of the analyses were of unequal size, the proportional chance criterion model (Morrison, 1969) was used for comparison and evaluation of the attained correct classification rates. A summary of the predictive accuracy of the discriminant analyses is given in Table 16. It should be noted that the proportional chance and prior

Table 13: Classification Results for Unsuccessful vs. Competitive Analysis

TOTAL SAMPLE (100%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		CPT 1	UNS 4
GROUP 1 COMPETITIVE	202	166 82.2%	36 17.8%
GROUP 4 UNSUCCESSFUL	150	54 36.0%	96 64.0%
UNGROUPED CASES	267		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 74.43%			

CROSS-VALIDATION ANALYSIS SAMPLE (72.4%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		CPT 1	UNS 4
GROUP 1 COMPETITIVE	139	117 84.2%	22 15.8%
GROUP 4 UNSUCCESSFUL	109	38 34.9%	71 65.1%
UNGROUPED CASES	200		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 75.81%			

HOLDOUT SAMPLE (27.6%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		CPT 1	UNS 4
GROUP 1 COMPETITIVE	63	44 69.8%	19 30.2%
GROUP 4 UNSUCCESSFUL	41	16 39.0%	25 61.0%
UNGROUPED	67		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 66.35%			

Table 14: Classification Results for Unsuccessful vs. Sheltered Analysis

TOTAL SAMPLE (100%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		SHL 2	UNS 4
GROUP 2 SHELTERED	50	25 50.0%	25 50.0%
GROUP 4 UNSUCCESSFUL	150	5 3.3%	145 96.7%
UNGROUPED CASES	419		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 85.00%			

CROSS-VALIDATION ANALYSIS SAMPLE (72.4%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		SHL 2	UNS 4
GROUP 2 SHELTERED	35	21 60.0%	14 40.0%
GROUP 4 UNSUCCESSFUL	109	3 2.8%	106 97.2%
UNGROUPED CASES	304		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 88.19%			

HOLDOUT SAMPLE (27.6%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		SHL 2	UNS 4
GROUP 2 COMPETITIVE	15	9 60.0%	6 40.0%
GROUP 4 UNSUCCESSFUL	41	3 7.3%	38 92.7%
UNGROUPED	115		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 83.93%			

Table 15: Classification Results for Unsuccessful vs. Homemaker Analysis

TOTAL SAMPLE (100%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		HMK 3	UNS 4
GROUP 3 HOMEMAKER	217	190 87.6%	27 12.4%
GROUP 4 UNSUCCESSFUL	150	47 31.3%	103 68.7%
UNGROUPED CASES	252		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 79.84%			

CROSS-VALIDATION ANALYSIS SAMPLE (72.4%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		HMK 2	UNS 4
GROUP 3 HOMEMAKER	165	146 88.5%	19 11.5%
GROUP 4 UNSUCCESSFUL	109	33 30.3%	76 69.7%
UNGROUPED CASES	174		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 81.02%			

HOLDOUT SAMPLE (27.6%)			
ACTUAL GROUP	NO. OF CASES	PREDICTED GROUP MEMBERSHIP	
		HMK 2	UNS 4
GROUP 3 HOMEMAKER	52	45 86.5%	7 13.5%
GROUP 4 UNSUCCESSFUL	41	13 31.7%	28 68.3%
UNGROUPED	78		
PERCENT OF 'GROUPED' CASES CORRECTLY CLASSIFIED: 78.49%			

Table 16: Predictive Accuracy of Discriminant Analysis

ANALYSIS	PROPORTIONAL CHANCE		OVERALL CLASSIFICATION ACCURACY		
	N	%	N	%	t
UNS-CPT	352	51.1	104	66.4	3.29**
UNS-SHL	200	62.5	56	83.9	4.37***
UNS-HMK	367	51.6	93	78.5	6.31***

GROUP MEMBERSHIP	PRIOR PROBABILITY		GROUP CLASSIFICATION ACCURACY		
	N	%	N	%	t
CPT	202	57.4	63	69.8	2.18*
UNS	150	42.6	41	61.0	2.42*
SHL	50	25.0	15	60.0	2.77*
UNS	150	75.0	41	92.7	2.64*
HMK	217	59.1	52	86.5	5.78***
UNS	150	40.87	41	68.3	3.77***

*p < .05
**p < .01
***p < .001

probability percentages in the second column of Table 16 were computed using data from the entire sample, and the overall and group classification accuracy percentages in column three of Table 16 are based on the hold-out sample results (box three in Tables 13, 14, and 15).

For the CPT-UNS analysis, overall classification accuracy was significantly greater than the (proportional) chance correct classification rate (66.4% vs. 51.1%), representing a 29.9% improvement in classification accuracy over chance. The results for the SHL-UNS analysis indicated that the obtained classification accuracy of 83.9% was significantly greater than the chance rate of 62.5% correct. This improvement represented an increase over chance of 34.2%. The results for the HMK-UNS analysis indicated a classification accuracy of 78.5%, which was significantly greater than the chance rate of 51.6% correct. This represented an improvement over the chance rate for the HMK-UNS analysis of 52.1%.

The group classification accuracy percentages given in the second box of Table 16 and in the third box in Tables 13, 14, and 15 indicate the rate at which the actual group membership was correctly predicted for each analysis. Of major interest in this investigation is the percent of actual UNS closure group members that were predicted to be in the UNS group. All of the group classification percentages in all three analyses were significantly greater than their respective prior probability percentage. In the CPT-UNS analysis, 61% of the actual UNS cases were correctly predicted to be unsuccessful; 92.7% in the SHL-UNS analysis and 68.3% in the HMK-UNS analysis were correctly predicted to be unsuccessful. Thus, the ability to correctly classify unsuccessful closures was best when they were contrasted with the sheltered closure cases, next best when the contrast was with the HMK group, followed by the contrast with the CPT group.

Interpretation of the Discriminant Functions

Methods. The discriminant functions are interpreted for the purpose of determining the relative importance of each of the independent variables in classifying cases into the outcome groups. Three methods have been used to accomplish this task: (1) interpretation of the standardized discriminant weights in a manner analogous to the interpretation of beta weights in regression analysis; (2) interpretation of the discriminant structure correlations, or discriminant loadings, in a manner similar to the interpretation of factor loadings in factor analysis; and (3) interpretation of the partial F-values (F-to-remove) on the last step of the stepwise computations.

The third approach to interpretation, that of examination of the final partial F-values, was chosen for this study because probability values were available for the F-values and for consistency with previous research. For those interested in pursuing an interpretation based on the standardized discriminant weights or the discriminant loadings, the appropriate data may be obtained by request from the authors.

Interpretation based on partial F-values. Because of the large number of potentially discriminating variables examined, some of the variables were poor discriminators, and some of the variables may have been intercorrelated with one another, thereby having redundant discriminatory information. Stepwise discriminant analysis addresses these problems. In the stepwise selection procedure, the first variable entered into the equation is the single best discriminating variable. Subsequent variables enter the equation based on their contribution to discrimination relative to the set of variables already in the equation, thereby producing an optimal set of discriminating variables. When more variables enter the equation, the contribution to

discrimination of previously entered variables may change; some variables may no longer contribute to discrimination while others may become more important. The F-to-remove, a partial multivariate F statistic, tests the significance of the decrease in discrimination if that variable were removed from the set of variables already selected. The larger the F-to-remove (and the smaller the significance of that F-value), the more important the contribution of that variable to the set of discriminating variables. Table 17 shows the discriminating variables for each of the three primary discriminant analyses, ordered by the significance of the F-to-remove and the associated Wilks' lambda.

Differences Between Outcome Groups for the Discriminating Variables

Tables 18, 19, and 20 show each of the discriminating variables with means for each outcome group for each of the three primary analyses. The tables also indicate the significance level of a univariate t-test of a difference between the outcome groups for each variable.

Categorization of Discriminating Variables and Unsuccessful Client Profiles

The Unsuccessful Versus Competitive Closure Client

The use of multiple discriminant analysis indicated that membership in the unsuccessful employment outcome group can be predicted and differentiated from each of the successful closure outcomes using a combination of vocational rehabilitation process variables, personal variables (which included biographical and visual disability related factors), financial and disincentive variables, environmental factors, and occupational history information. Training and experience characteristics of the rehabilitation

Table 17: Summary and Significance of Discriminating Variables

UNSUCCESSFUL - COMPETITIVE ANALYSIS

	Variable	p*	Label
1	NOCC	.0018	Number of Occupations
2	C26	.0023	Proximity to VR Counselor
3	C11	.0056	Occupational Goal TVQ at First IWRP
4	C5A	.0063	Used Optical Aid
5	E21A	.0065	Sum Surgery-Treatment & Other Physical Restoration
6	C15	.0070	Time from Previous Occupation to Referral
7	SEVDIS2	.0118	Severe Secondary Disability
8	R33C	.0242	Primary Support at Referral was Transfer Payments
9	R64A	.0255	Received Non-Institutional Training
10	C1	.0273	Received SSDI During Service
11	YDPR	.0455	Years Disabled Prior to Referral
12	NDIS	.0532	Number of Additional Disabilities

UNSUCCESSFUL - SHELTERED ANALYSIS

	Variable	p*	Label
1	C2	<.0001	Age at Onset of Blindness
2	E36	<.0001	Expenditure For PAT-VAT
3	R13A	<.0001	White or Non-White
4	R26	.0001	Highest Grade Completed
5	R6E	.0027	Referred by Private Organizations
6	R72E	.0042	Primary Disorder of Lens
7	R42	.0056	Supplemental Security Income Fund Total Expenditure
8	R21B	.0062	Mos. Since Previous Unsuccessful Closure
9	C3	.0067	Visual Efficiency Percent Loss
10	E33	.0158	Expenditure for Business Training
11	R72D	.0346	Primary Disorder of Cornea & Sclera
12	R72J	.0452	Primary Disorder of Eye Not Specified

UNSUCCESSFUL - HOMEMAKER ANALYSIS

	Variable	p*	Label
1	R9A	<.0001	Gender
2	C11	.0002	Occupational Goal TVQ at First IWRP
3	R7	.0002	Age at Referral
4	R59	.0003	Received Restoration
5	C26	.0011	Proximity to VR Counselor
6	R54	.0076	No. Mos. in Training
7	R64A	.0129	Received Non-Institutional Training
8	R23A	.0168	Currently Married
9	R6B	.0235	Referred By Educational Institution
10	R31	.0251	Public Assistance Monthly Amount At Referral
11	R67	.0458	Received Maintenance
12	C5B	.0468	Used Non-Optical Aid

*Significance of F-to-Remove

Table 18: Summary Means for Discriminating Variables in the Unsuccessful vs. Competitive Analysis

VARIABLE		GROUP MEAN CPT	GROUP MEAN UNS	p
1. Number of Occupations	NOCC	1.63	1.44	(.09)
2. Proximity to VR Counselor	C26	21.18	12.96	***
3. Occupational Goal TVQ at First IWRP	C11	61.20	55.57	***
4. Used Optical Aid	C5A	.421	.280	**
5. Sum Surgery-Treatment and Other Physical Restoration	E21A	218	113	*
6. Time from Previous Occupation to Referral	C15	8.54	26.62	***
7. Severe Secondary Disability	SEVDIS2	.144	.367	***
8. Primary Support at Referral was Transfer Payments	R33C	.332	.560	***
9. Received Non-Institutional Training	R64A	.391	.260	**
10. Received SSDI During Service	C1	.312	.440	**
11. Years Disabled Prior to Referral	YDPR	15.65	11.77	**
12. Number of Additional Disabilities	NDIS	.743	1.240	***

Note: Fortt-test, *p<.05; **p<.01; ***p<.001.

Table 19: Summary Means for Discriminating Variables in the Unsuccessful vs. Sheltered Analysis

VARIABLE		GROUP MEAN CPT	GROUP MEAN UNS	p
1. Age at Onset of Blindness	C2	12.32	28.18	***
2. Expenditure for PAT-VAT	E36	32.98	905	***
3. White or Non-White	R13A	.500	.720	**
4. Highest Grade Completed	R26	7.80	10.47	***
5. Referred by Private Organizations	R6E	.060	.020	(.15)
6. Primary Disorder of Lens	R72E	.260	.140	*
7. Supplemental Security Income Fund Total Expenditure	R42	413	572	NS
8. Mos. Since Previous Unsuccessful Closure	R21B	.700	.133	(.09)
9. Visual Efficiency Percent Loss	C3	94.18	94.44	NS
10. Expenditure for Business Training	E33	15.78	0.00	*
11. Primary Disorder of Cornea & Sclera	R72D	.020	.053	NS
12. Primary Disorder of Eye Not Specified	R72J	.100	.020	**

Note: For.t-test, *p<.05; **p<.01; ***p<.001; NS.= Not Signficant.

Table 20: Summary Means for Discriminating Variables in the Unsuccessful vs. Homemaker Analysis

VARIABLE		GROUP MEAN HMK	UNS	p
1. Gender	R9A	.737	.420	***
2. Occupational Goal TVQ at First IWRP	C11	50.38	55.57	***
3. Age at Referral	R7	56.04	39.91	***
4. Received Restoration	R59	.567	.347	***
5. Proximity to VR Counselor	C26	21.12	12.96	***
6. No. Mos. in Training	R54	4.00	10.71	***
7. Received Non-Instutional Training	R64A	.369	.260	*
8. Currently Married	R23A	.498	.320	***
9. Referred by Educational Institution	R6B	.009	.060	**
10. Public Assistance Monthly Amount at Referral	R31	22.70	48.44	**
11. Received Maintenance	R67	.124	.273	***
12. Used Non-Optical Aid	C5B	.180	.140	NS

Note: Fortt-test, *p<.05; **p<.01; ***p<.001; NSt= Not Signficant.

counselor, as measured in this study, did not contribute significantly to the (post hoc) prediction process.

Profile of the Unsuccessful Versus Competitive Closure Client

Table 21 displays the discriminating variables for this analysis as a function of the variable category. Over 50% of the discriminating variables were associated with the vocational rehabilitation process and with biographical and disability characteristics of the blind client. The vocational rehabilitation process category included 3 of 12 predictor variables (25%) and these had an average rank of 5.7. Compared to the CPT client, the UNS client had a lower skill level of the IWRP occupational goal, had a smaller expenditure for surgery/treatment and other physical restoration services, and was less likely to receive noninstitutional training.

Biographical and disability variables comprised 33% (4 of 12) of the discriminating variables with an average rank of 8.5. The UNS client was less likely to use an optical aid, was more likely to have a severe nonvisual disability, had a visual disability prior to referral for a fewer number of years, and had more disabilities in addition to blindness than the CPT client.

Financial category variables accounted for 17% (2 of 12) of the predictors and had a rank of 9. UNS clients were more likely to have received primary support at referral from transfer payments and more likely to have received SSDI during service than CPT group clients.

The only environmental variable difference was that the UNS clients lived an average of eight miles closer to their VR counselor than their CPT client counterparts. Regarding the occupational history category, the UNS clients spent more than three times longer from their previous occupation to referral, but there was not a significant difference in number of occupations prior to referral when compared to the CPT clients.

Table 21: Categories of the Variables Discriminating Unsuccessful from Competitive Clients

VARIABLE		VARIABLE CATEGORY				
		Voc. Rehab. Process	Biographical and Disability	Financial/ Disincentive	Geographic/ Environmental	Occupational History
1. Number of Occupations	NOCC					X
2. Proximity to VR Counselor	C26				*	
3. Occupational Goal TVQ at First IWRP	C11	*				
4. Used Optical Aid	C5A		*			
5. Sum Surgery-Treatment and Other Physical Restoration	E21A	*				
6. Time from Previous Occupation to Referral	C15					*
7. Severe Secondary Disability	SEVDIS2		*			
8. Primary Support at Referral was Transfer Payments	R33C			*		
9. Received Non-Institutional Training	R64A	*				
10. Received SSDI During Service	C1			*		
11. Years Disabled Prior to Referral	YDPR		*			
12. Number of Additional Disabilities	NDIS		*			
Percent of Variables in Each Category		3/12 = 25%	4/12 = 33%	2/12 = 17%	1/12 = 8%	2/12 = 17%
Average Rank for Each Category		5.7	8.5	9	2	3

Note: "*" indicates significant ($p < .05$) univariate group differences.. See Table 18.

Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research

IWRP occupational goal skill level (TVQ). The client's vocational objective, expressed as a TVQ score indicating job skill level, was substantially lower for the UNS group compared to the CPT group. This variable was reported to be an important discriminator among all four employment outcome groups (Giesen et al., 1985) but was less important (18th in rank) in discriminating between the four outcome groups for elderly blind clients (Giesen & Ford, 1986). With the exception of the two studies just cited, studies of rehabilitation outcome have not quantified occupations or occupational goals, so the field has not had a method for assessing the contribution of this factor in influencing employment outcomes.

Given the importance of the IWRP vocational goal, as measured by the TVQ index, it should be given definite attention by counselors and administrators. Using the TVQ score to identify employment options for disabled people has been reported by McCroskey and Perkins (1981). Considering the importance of this factor as recently demonstrated (Giesen et al., 1985), it should definitely be included in future research with blind and visually impaired persons.

Expenditure for surgery/treatment and other physical restoration. Receipt of physical restoration, but not specific expenditure amount, has been reported to be linked to employment outcome (Crouse, 1974; Giesen & Ford, 1986; Giesen et al., 1985). The UNS clients had an average expenditure on this measure that was a little more than half that of the expenditure for the CPT clients.

Receipt of noninstitutional training. Training has been reported to be associated with successful rehabilitation outcome (Bowman & Micek, 1973). Noninstitutional training (on-the-job or miscellaneous vocational training) has been more frequently associated with wage earning outcomes (CPT, SHL) than

with nonwage earning outcomes (HMK, UNS) (Giesen et al., 1985), but it was not a discriminator of outcome for elderly blind individuals (Giesen & Ford, 1986). In the present study, only about one-fourth of the unsuccessfully closed clients received noninstitutional training, while about 40% of the competitive clients received this type of training.

Biographical and Disability Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research

Use of optical aids. The rate of use of optical aids has not been reported previously to be related to employment outcome. The frequency of use of optical aids was significantly lower for the UNS compared to the CPT clients. Interestingly, the likelihood of using optical aids is very similar to the likelihood of receiving noninstitutional training.

Presence of severe secondary disability. Secondary or nonvisual disabilities were considered severe if they met the criteria specified by Hill (1985) and RSA codes for severe disability. Bauman and Yoder (1964) reported that the absence of major health problems was a characteristic of the typical blind worker. Scholl et al. (1969) reported that the presence of other disabilities was one of several good predictors of time worked, income, and a socioeconomic occupation index. Kirchner and Peterson (1982) also found that absence of secondary disabling conditions was characteristic of clients closed in competitive employment. In this investigation, the presence of a severe secondary disability was more than twice as great (approaching 40%) for the unsuccessful group as for the competitive closure group.

Years disabled prior to referral. This variable has not been previously associated with employment outcomes. The UNS group clients had a visual disability for a shorter time period than the CPT group prior to referral, but both groups appear to have been visually disabled for over a decade before

referral. Age at onset of blindness needs to be considered in interpreting this finding. The CPT group experienced onset of blindness in the late teens, while onset in the UNS group was in the latter twenties. The CPT group thus began coping with their disability relatively early by learning alternative skills, while the UNS group began coping with their disability significantly later and had less time to learn these important skills. Longer periods of coping with disability on the part of the blind or severely visually impaired client were associated with competitive rather than unsuccessful outcome.

Number of additional disabilities. Previous research has indicated that additional nonvisual disabilities are associated with lower socioeconomic status, decreased percentage of time worked, and lower income (Scholl et al., 1969), and noncompetitive employment outcomes for blind (Giesen et al., 1985) and for elderly blind (Giesen & Ford, 1986) clients. Findings of the present study were consistent with previous research. CPT group clients had fewer additional disabilities than UNS group clients.

Financial/Disincentive Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research

Primary support at referral of transfer payments. The financial resources of the client at referral have been associated with rehabilitation outcome in previous research (Bolton, 1972a; DeMann, 1963; Scheinkman, Menz, Andrew, Currie, & Dunn, 1975). Primary support at referral from personal/private sources was reported to be more likely for competitive closure clients in general (Giesen et al., 1985) and for elderly blind clients (Giesen & Ford, 1986). This study found that over half of the UNS group clients, compared to a third of the CPT clients, received transfer payments as their primary support at referral.

Received SSDI during service. Giesen et al. (1985) reported that receipt

of SSDI during rehabilitation services contributed to multivariate discrimination among outcome groups with a trend for receipt to decrease from unsuccessful to competitive employment outcomes. The present investigation was consistent with this pattern, indicating that slightly under half of the UNS group clients, compared to just under one-third of the CPT group clients, were receiving SSDI during service.

Environmental Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research

Proximity to VR counselor. Distance in miles from the rehabilitation counselor's office to the home of the blind client and its relationship to employment outcome has been examined only very recently in previous research. For a general sample (Giesen et al., 1985) and an elderly sample (Giesen & Ford, 1986) of blind clients, those closed as homemakers and unemployed were most likely to reside closest to the counselor, while competitive or sheltered employment closure clients lived farther away. Results of the present study were consistent with previous research: the CPT clients lived, on the average, about eight miles farther from their counselor than did the UNS clients. One possible interpretation of this finding is that the greater the distance traveled by the blind client to the counselor or counselor to client, the greater the commitment and motivation on the part of one or both to a successful wage earning closure. Other possible explanations include: (a) Service delivery and client need patterns may be different for urban versus rural locations, (b) case selection favoring successful closure may be more salient for the counselor when travel distances are greater, (c) multihandicapped blind persons may be restricted from access to rehabilitation services when significant travel is involved, and (d) client referral systems function differently when the rehabilitation counselor is located close to the client.

Occupational History Variables that Discriminate Unsuccessful from Competitive Closure Clients and Relationships to Past Research

Number of previous occupations. As in Giesen et al. (1985), the number of occupations held by the client prior to referral was an important multivariate discriminating variable in the present study, but it did not show a significant univariate difference between the CPT and UNS groups. However, there was a trend for the CPT group clients to have held more jobs than the UNS group clients, as expected.

Time since previous occupation. A substantial portion of the research literature (e.g., "New Study," 1983) suggests that early intervention facilitates positive rehabilitation outcomes. Both the present study and Giesen et al. (1985) found that competitively closed clients were unemployed prior to referral for a relatively short period compared to other closure groups. In this study the CPT group spent about 8.5 months between last employment and referral, compared to over 2 years for the UNS group.

Interpretation of Differences Between Unsuccessful and Competitive Clients

Severe disability. Variables related directly or indirectly to disability seem to comprise one important way in which UNS clients differ from CPT clients. UNS clients have more additional disabilities and more severe secondary disabilities. The severe secondary disabilities seem to impact on vocational good development; that is, the skill level (TVQ) of the IWRP vocational goal was considerably lower for the UNS clients than for the CPT clients.

Disincentive. Another factor that seems to operate to differentiate these groups is related to financial disincentive. Disincentives to return to work may have resulted as a consequence of disability. For example, severe disability is linked to greater opportunity for receipt of transfer payments.

Compared to CPT clients, the UNS clients were more often receiving transfer payments at referral and presumably had been receiving them since their last occupation, which was a time period over three times longer for the UNS group than for the CPT group.

More disabilities for the clients in the UNS group appear to lead to other disincentives. These additional disabilities impact on work history and work-related training, which may account for the trend toward fewer previous occupations, noninstitutional training (on-the-job and miscellaneous training), less emphasis on use of optical aids, and the seeking of rehabilitation services sooner after onset for the UNS than for the CPT group. Compared to the CPT group, the general characterization of the UNS group clients as "health care seeking rather than vocational development seeking" seems to be appropriate.

Further, more disabilities and more severe ones for the UNS group may be related to the lesser expenditure for restoration services. Primary eye disorders such as diabetic retinopathy and optic nerve atrophy were two to three times higher in the UNS group. The most prevalent secondary disability was diabetes mellitus for both the CPT and the UNS group, but the rate of incidence was almost three times higher (22%) in the UNS group. Since such disabilities may be less amenable to surgical or physical restoration, lesser expenditure for restoration was expected and found in the UNS group.

The closer proximity to the VR counselor of the UNS client compared to the CPT client may be associated with decreased mobility brought on by greater disability; also, there may be urban/rural differences in service delivery and need patterns, the counselor may tend to be more selective of cases--favoring likely competitive closure clients--when greater travel distances are involved, and referral processes may function differently when the rehabilitation counselor is located close to the client.

The Unsuccessful Versus Sheltered Closure Client

Profile of the Unsuccessful Versus Sheltered Closure Client

As shown in Table 22, only variables in the rehabilitation process and biographical categories were found to discriminate between these two groups. The vocational rehabilitation process category had 42% of the discriminating variables with an average rank of 6.4. Variables in this category indicated that the unsuccessful group clients had fewer expenditures (less than a third) for PAT-VAT and business training than the sheltered group clients. The other variables in the vocational rehabilitation process column in Table 22 contributed to multivariate discrimination of the groups but did not show significant univariate group differences (see the second box in Table 19).

The seven biographical category variables represented 58% of the discriminating variables and had a mean rank of 6.6. Thus, it appears that biographical and disability variables were slightly more important than rehabilitation process variables in discriminating between the SHL and UNS groups. The biographical category variables revealed that, as a group, the UNS clients experienced the age of onset of blindness when near 30 years of age, almost two and one half times the age of onset for the SHL group. The UNS group was more likely to be white than nonwhite, and had an educational level almost three grades higher, were less likely to have a disorder of the lens, and were less likely to have an unspecified primary eye disorder than the SHL group clients. The other two variables in this category did not show the significant univariate group differences. No financial/disincentive, environmental, or occupational variables were found to discriminate unsuccessful from sheltered closure clients.

Table 22: Categories of the Variables Discriminating Unsuccessful from Sheltered Clients

VARIABLE		VARIABLE CATEGORY				
		Voc. Rehab. Process	Biographical and Disability	Financial/ Disincentive	Geographic/ Environmental	Occupational History
1. Age at Onset of Blindness	C2		*			
2. Expenditure for PAT-VAT	E36	*				
3. White or Non-White	R13A		*			
4. Highest Grade Completed	R26		*			
5. Referred by Private Organizations	R6E	X				
6. Primary Disorder of Lens	R72E		*			
7. Supplemental Security Income Fund Total Expenditure	R42	X				
8. Mos. Since Previous Unsuccessful Closure	R21B	X				
9. Visual Efficiency Percent Loss	C3		X			
10. Expenditure for Business Training	E33	*				
11. Primary Disorder of Cornea & Sclera	R72D		X			
12. Primary Disorder of Eye Not Specified	R72J		*			
Percent of Variables in Each Category		5/12 = 42%	7/12 = 58%	0%	0%	0%
Average Rank for Each Category		6.4	6.6	-	-	-

Note: "*" indicates significant ($p < .05$) univariate group difference. See Table 19.

Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Sheltered Closure Clients and Relationships to Past Research

Expenditure for PAT-VAT. Previous research has reported that receipt of personal adjustment services was a useful predictor of employment outcome (Crouse, 1974) and that expenditure for PAT/VAT tended to be three to four times higher for sheltered group closure clients than for those in other outcome groups (Giesen & Ford, 1986; Giesen et al., 1985). The findings for this study were consistent with previous research with respect to this comparison.

Referred by private organizations. There was a trend for a higher percentage of clients in the SHL group compared to the UNS group to have been referred by private organizations, but the actual percentage for either group was quite low. Referral source has not previously been reported to be related to employment outcome.

Supplemental Security Income Fund total expenditure. Though not significant by the univariate test, the mean cost of rehabilitation services covered by Supplemental Security Income for the UNS group was somewhat higher than that for the SHL group.

Months since previous unsuccessful closure. There was a marginally significant trend for the UNS group compared with the SHL group to have a more recent previous closure that was unsuccessful. Factors related to previous participation in the rehabilitation process have not been reported to be related to client outcome in past studies of blind and visually impaired persons.

Expenditure for business training. As previously noted, receiving training has been linked to successful rehabilitation outcomes (Bowman & Micek, 1973) and wage earning outcomes (Giesen et al., 1985). As expected, there was spending for business training for SHL group clients, but there was no spending in this category for UNS clients.

Biographical and Disability Variables that Discriminate Unsuccessful from Sheltered Closure Clients and Relationships to Past Research

Age of onset of blindness. This variable has been previously reported to be related to rehabilitation outcomes of blind (Giesen et al., 1985; Knowles, 1969) and elderly blind (Giesen & Ford, 1986) clients. The present study is consistent with previous research in finding the SHL group clients to have a considerably earlier onset age than that of the UNS group clients. The pattern of the means suggests that persons whose onset of blindness occurs while the individual is age appropriate for the educational system will learn skills which assist them to enter the work world. Persons who become blind after the early to mid twenties and prior to middle age often do not have the opportunity to learn, practice, and acquire proficiency at those skills transferable to employment settings that are taught to blind and visually impaired youth in educational settings.

Race. Several studies of nonvisually impaired disabled persons have reported a correlation between race and rehabilitation outcome (Berkowitz et al., 1975; Hammond et al., 1968; Kunce, Miller, & Cope, 1974; Scheinkman, Menz et al., 1975; Walls & Tseng, 1976). While Giesen and Ford (1986) did not find race to be related to outcome for elderly blind clients, Giesen et al. (1985) and the present study reported race defined as white/nonwhite to be an important discriminator between outcome groups, with the proportion of nonwhite blind clients significantly higher in the SHL compared to the UNS or any other outcome group. Probably, more nonwhites are closed in sheltered employment because they historically have had fewer years of education and less access to employment opportunities, due to either discrimination or skill deficits, with sheltered employment being their only opportunity for work.

Highest grade completed. Educational level was higher for the UNS compared

to the SHL group in the present investigation. Berkowitz et al. (1975) reported a higher educational level to be associated with successful closure, but Giesen et al. (1985) showed that the pattern is not consistent across successful closure groups (CPT, SHL, HMK). Education was not associated with outcome for elderly blind clients (Giesen & Ford, 1986).

Primary disorder of lens. Specific visual disorder groups have not previously been associated with employment outcome. This research found that the incidence of lens disorders was higher for the SHL group (26%) than for the UNS group (14%).

Visual efficiency percent loss. Even though it contributed to multivariate discrimination, there was no univariate difference between the SHL and UNS groups in visual efficiency.

Primary disorder of cornea and sclera. This was a significant variable in iscriminant analysis, but no univariate difference was obtained on this measure.

Primary disorder of eye unspecified. There was a higher percentage of unspecified eye disorders in the SHL (10%) than in the UNS (2%) group, probably due to less thorough medical evaluation of clients in the SHL group.

Interpretation of Differences Between Unsuccessful and Sheltered Clients

Training. One group of variables that differentiates the two groups relates to training expenditures. Sheltered group clients had more than three times the expenditures for PAT-VAT than clients in the unsuccessful group. The SHL group clients had a small expenditure for business training compared to no expenditure in this category for the UNS group. This finding is not surprising given that the SHL group had a much earlier age of onset and thus entered the rehabilitation system early, and that they had an educational level almost three grades lower than UNS group clients. Both of these factors would contribute to

the opportunity and/or need for considerable vocational adjustment training.

Eye disabilities. Other differences between unsuccessful and sheltered closure clients relate to eye disabilities. Compared to the UNS clients, lens disorders were more characteristic of SHL clients, as well as unspecified eye disorders. The latter finding probably represents a less thorough medical evaluation of the SHL clients.

Minority client. The pattern of differences between unsuccessful and sheltered clients also suggests differences relating to a minority factor. The sheltered group clients were more likely to be nonwhite and, as already noted, had a lower educational level than unsuccessful group clients.

The Unsuccessful Versus Homemaker Closure Client

Profile of the Unsuccessful Versus Homemaker Closure Client

Table 23 indicates the categories of variables discriminating between the UNS and HMK groups. Clearly, rehabilitation process was the major category of variables discriminating these two groups, with 50% of the discriminating variables and an average rank of 6.5. Next most important was the biographical and disability category with 33% of the variables and a rank of 6.

For variables in the rehabilitation process category, as compared with clients in the HMK group, those in the UNS group had a higher skill level of their IWRP vocational goal, were less likely to have received restoration services, were in training for a longer time, were less likely to receive noninstitutional training, were more likely to have been referred by an educational institution, and were more likely to have received maintenance services.

Biographical category variables indicated that the unsuccessful clients were more likely to be male, were referred when over 16 years of age younger,

Table 23: Categories of the Variables Discriminating Unsuccessful from Homemaker Clients

VARIABLE		VARIABLE CATEGORY				
		Voc. Rehab. Process	Biographical and Disability	Financial/ Disincentive	Geographic/ Environmental	Occupational History
1. Gender	R9A		*			
2. Occupational Goal TVQ at First IWRP	C11	*				
3. Age at Referral	R7		*			
4. Received Restoration	R59	*				
5. Proximity to VR Counselor	C26				*	
6. No. Mos. in Training	R54	*				
7. Received Non-Institutional Training	R64A	*				
8. Currently Married	R23A		*			
9. Referred by Educational Institution	R6B	*				
10. Public Assistance Monthly Amount at Referral	R31			*		
11. Received Maintenance	R67	*				
12. Used Non-Optical Aid	C5B		X			
Percent of Variables in Each Category		6/12 = 50%	4/12 = 33%	1/12 = 8%	1/12 = 8%	0%
Average Rank for Each Category		6.5	6	10	5	-

Note: "*" indicates significant ($p < .05$) univariate group differences. See Table 20.

and were less likely to be currently married than homemaker group clients.

The only financial category variable, amount of public assistance at referral, revealed that the UNS group clients received a greater amount than the HMK clients. The only environmental variable indicated that the UNS clients lived significantly closer, about 8 miles on the average, to their VR counselor than the HMK clients.

Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research

Occupational goal skill level (TVQ). The client's vocational objective, expressed as a TVQ score indicating job skill level, was significantly higher for the UNS group compared with the HMK group. This variable was also found to be an important discriminator between the UNS and CPT group in the present investigation. Previous research and contextual information are provided in the discussion of this measure in the section "Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients."

Receipt of restoration services. Previous research has reported that receipt of physical restoration was related to rehabilitation outcomes for blind (Crouse, 1974; Giesen et al., 1985) and elderly blind (Giesen & Ford, 1986) individuals, with higher percentages of receipt associated with HMK and CPT groups compared to UNS and SHL groups. Similarly, the present study showed that about a third received restoration in the UNS group compared to over half in the HMK group. These findings likely result from an interaction of gender, ocular pathology, and the homemaker closure status. It may be easier to justify providing cataract surgery, for example, to a 58 year old female and closing her as a homemaker than doing so for a male. A male with similar characteristics would likely be closed unsuccessful "28" or would not receive cataract surgery

and would be closed in status 30.

Number of months in training. The only previous research on training concerned type of training (noninstitutional), which was also found to discriminate between CPT and UNS groups. This research is cited in the section "Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients." This study indicated that the HMK group spent only about a third as long in training as the UNS group. In comparison with other outcome groups the length of training for the HMK group is very low. The UNS group is similar to the CPT and SHL groups in length of time in training. The HMK group apparently is not given or is not deemed as needing as much time in training activities as the UNS group, and this is a significant discriminating factor between these groups.

Receipt of noninstitutional training. This variable was also found to discriminate between CPT and UNS groups, and previous relevant research is noted in the section "Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients." The pattern of differences between the means found in the present study is almost identical to that for the discrimination between the CPT and UNS groups: the UNS group was less likely (26%) to receive noninstitutional training than the HMK group (37%).

Referral by an educational institution. Referral source has not been reported in other research to be related to employment outcome. Private referral was a contributor to discrimination between the SHL and UNS groups, as reported previously in this study. The present analysis found that clients in the HMK group were very unlikely (<1%) to be referred by an educational institution, while the rate for clients in the UNS group was about 6%.

Receipt of maintenance. Receipt of maintenance was reported to be an

important discriminator of outcome groups for a general blind (Giesen et al., 1985) and an elderly blind (Giesen & Ford, 1986) sample. Consistent with previous research, the present study observed that only about 13% of the HMK group, compared to 27% of the UNS group, received maintenance. Persons in the HMK group probably received fewer services requiring maintenance away from home because this closure is aimed at maintaining an individual in a home environment.

Biographical and Disability Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research

Gender. Previous research (Bolton, 1972a; Scheinkman, Dunn, Menz, Andrew, & Currie, 1975; Scholl et al., 1969; Wright & Trotter, 1968) has reported that successful rehabilitation outcome is more often associated with males than with females. In contrast, Giesen et al. (1985) reported that there was a higher proportion of females in the homemaker group, but no difference in the gender distribution in competitive, sheltered, and unemployed closure groups. Giesen and Ford (1986) found the same pattern for elderly blind clients. The present study observed that the greater proportion of females in the HMK group compared to that in the UNS group discriminated between these two groups. Counselors need to be aware that stereotyped expectations about the work capabilities of female blind clients likely do not mirror the real potential of each client. Counselors need to weigh each case on its own merits and be sensitive to possible sex bias in expectations for employment outcomes.

Age at referral. Knowles (1969) reported that age at rehabilitation was related to successful versus unsuccessful rehabilitation outcome. The present study found that, on the average, the HMK group clients were in their mid fifties, while the UNS group clients were in their early forties. This pattern suggests that blind persons referred later in life (and probably having later

onset of blindness) are likely to be associated with the homemaker outcome group.

Currently married. About 50% of the clients in the HMK group, compared to just under a third in the UNS group, were currently married. This finding appears to be inconsistent with Bauman and Yoder (1964), who reported being married to be characteristic of a successful blind worker. Actually, this discrepancy may reflect differences among the successful closure groups such that the percent currently married is high only for the HMK group and the other successful outcome groups have a percentage similar to the UNS group. This finding indicates again the necessity for subdividing the successful outcome category into CPT, SHL, and HMK groups.

Use of nonoptical aids. This variable was a significant multivariate discriminator between the HMK and UNS groups, but the group means were not different for the univariate test. Giesen and Ford (1986) reported that the use of nonoptical aids was extremely low (less than 5%) in the sheltered and unemployed groups and somewhat higher (15% to 23%) for competitive and homemaker groups for elderly blind clients. The trend in the means for the present study is consistent with this pattern.

Financial/Disincentive Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research

Public assistance amount at referral. The financial resources of the client at referral have been associated with rehabilitation outcome in previous research (Bolton, 1972a; DeMann, 1963; Scheinkman, Menz et al., 1975). Primary support at referral from personal/private sources was reported to be more likely for competitive closure clients in general (Giesen et al., 1985) and for elderly blind clients (Giesen & Ford, 1986). This study observed that the UNS group was receiving more than twice as much money, on the average, as the HMK group (see Table 20).

Environmental Variables that Discriminate Unsuccessful from Homemaker Closure Clients and Relationships to Past Research

Proximity to VR counselor. The distance from the rehabilitation counselor's office and the UNS client's home was about 13 miles on the average, while the distance for the HMK client was about 21 miles. An identical pattern was found between the UNS and CPT groups discussed previously. Previous research and possible interpretations for proximity difference between outcome groups was discussed in the section, "Vocational Rehabilitation Process Variables that Discriminate Unsuccessful from Competitive Closure Clients."

Interpretation of Differences Between Unsuccessful and Homemaker Clients

Youthful referral. The first set of related variables that differentiate these client groups primarily involves age and time in training. These include the UNS clients being younger, being in training for a longer time, being more likely to receive maintenance, having a higher occupational goal TVQ, and being more likely to be referred by an educational institution as compared to the HMK client group.

The UNS clients are less elderly than the HMK clients when they enter the vocational rehabilitation system. Due probably to their younger age, the UNS clients are more likely to have been referred by an educational system. Also, being younger at referral probably leads to a good vocational prognosis, reflected in a higher vocational goal. In an effort to achieve this goal, the UNS client spends, for example, more time in training and receives more maintenance, thus receiving more vocational attention than the HMK client.

Restorable disabilities. A second set of related differences involved receipt of restoration and proximity of counselor. The differences tend to further characterize the HMK group, who were more likely to receive restoration services (they had more cataracts as a second eye disorder); were living farther

from their VR counselor; were receiving less public assistance at referral, thus having less disincentive to find work; and were more likely to be currently married than the UNS group clients.

Service occupations. A third set of related discriminating variables involved gender and receiving noninstitutional training. The UNS clients were less likely to receive noninstitutional (on-the-job and miscellaneous) training and less likely to be female than HMK clients. This pattern suggests that jobs held by HMK clients are held mostly by females and involve on-the-job and miscellaneous training.

OBSERVATIONS

The findings of this study have implications for policies and delivery of rehabilitation services by rehabilitation agencies impacting the employment and underemployment of blind and visually impaired clients, particularly those clients likely to be closed unsuccessfully.

Program/Administrative Issues

1. In contrast to successful employment outcome group clients (CPT, SHL, HMK), the unsuccessful closure client is difficult to characterize. Because of the inherent heterogeneity of unsuccessful closure clients, more success can be achieved by describing the successful employment group of interest and indicating how the unsuccessful group differs from that description. It is, however, possible to determine which of the successful closure groups the unsuccessful group most closely resembles. This is indicated by the tendency for the classification phase of the discriminant analysis to misclassify the UNS client. The UNS client was misclassified as a CPT client most often (36%), next most often as a HMK client (31%), and least often as a SHL client (3%). One interpretation of these results is that in the UNS client group there are individuals who, with the maximally effective set of vocational services, stand a good chance of becoming competitive or homemaker closures. Thus, there is considerable potential for successful employment closures within the unsuccessful group.
2. The main factors that differentiate unsuccessful and competitive closure clients relate to number and severity of additional disabilities, and disincentive factors often resulting from severe disability. Agencies need to be aware of the need for comprehensive medical evaluation and

appropriate medical, restorative, and rehabilitative services to maximize the employment potential of all clients, thereby averting unsuccessful closures.

3. Disincentives to return to work may be due, in part, to disabilities. Agencies need to focus policy and management planning efforts on new and creative ways to overcome or lessen disincentives to return to work.
4. Unsuccessful closure clients differ markedly from sheltered closure clients. There was only a 3% discriminant misclassification of unsuccessful closure clients as sheltered closure clients. Relative to unsuccessful closure clients, sheltered clients receive considerably more training, have a lower educational level, and have a much earlier age of onset of blindness. They also have a higher prevalence of eye disabilities (lens and unspecified disorders) and are more likely to be nonwhite.
5. The main factors that differentiate unsuccessful and homemaker closure clients relate to youthful referral, disabilities amenable to physical restoration, and occupational category. In contrast to homemaker closure clients, potential unsuccessful closure clients will be younger, spend more time in training, and have a vocational goal with a high difficulty index. The client likely headed for unsuccessful closure will have disabilities less subject to restoration, live closer to the counselor, and more often be unmarried. The potential unsuccessful closure client will also be less likely to be pursuing jobs requiring OJT or those traditionally held by females, such as service occupations.
6. About a third of the unsuccessful closure clients were misclassified as homemakers. These cases thus possessed characteristics closely

resembling other cases closed as homemakers. Homemaking may have been a more appropriate vocational goal for many clients who were unsuccessfully rehabilitated.

7. Previous research based on division of outcomes simply into successful (26) and unsuccessful (28) categories does not allow important differences among successful closures to be identified. In order for progress to be made in understanding rehabilitation outcomes, closure categories must be separated into competitive, sheltered, homemaker, and unsuccessful groups at a minimum.
8. Relatively large proportions of cases in the unsuccessful closure group had diabetic retinopathy and optic nerve atrophy as their primary eye disorders. Because these two disorders have different courses and likely affect individuals differently, additional research is necessary to understand the relationship between the disorders and rehabilitation outcomes.
9. Counselors and agencies are serving blind and visually impaired cases that are more severely disabled than statistical records indicate. The presence of secondary and tertiary nonvisual disabilities has been found to reduce the likelihood of competitive employment closures. The presence of more disabilities and more severe disabilities was a major characteristic of unsuccessfully closed clients, particularly in contrast with competitively closed clients. Case management procedures should be initiated which thoroughly identify all visual and nonvisual disabilities of the blind client and specify in the development of the IWRP how the impact of the additional disabilities on functioning will be eliminated or minimized.
10. Diabetes mellitus was the most frequently reported secondary nonvisual

disability for the total sample and was quite frequent (22%) in the unsuccessful closure group. It was observed that few case files included documentation of comprehensive diagnostic evaluation, medical rehabilitation or treatment programs, or other diabetic support services. Since these kinds of services could minimize the impact of diabetes mellitus on the role performance of the diabetic client likely to be closed unsuccessfully (and diabetic clients closed in other statuses), case management policies are needed which assure that the total rehabilitation needs of these clients are being met. Such policies could reduce the likelihood of unsuccessful closure and increase the rate of wage earning closures.

11. Age at onset of blindness has been found to be an important discriminator among outcome groups for blind clients in general and for elderly blind clients. Age at onset was the most important discriminator in this study between the unsuccessful and sheltered closure clients. Administrators need to include and attend to age at onset of blindness as part of the agency management information base.
12. Race was related to employment outcomes for blind clients in general but not for elderly blind clients. In this study, race was an important discriminator between the unsuccessful and sheltered closure clients.
13. Proximity in miles of the blind client to the office of the rehabilitation counselor has been related to employment outcomes for blind clients in general and for elderly blind clients. Clients likely to be closed unsuccessfully tend to live close to the counselor, particularly in contrast to clients likely to be closed in competitive employment and as homemakers. Decreased mobility due to more severe disabilities may be associated with this factor for the unsuccessful

closure client. Also, service delivery appears to be affected by these kinds of proximity factors.

14. Work histories of blind clients provide important information about the employment outcomes. Here and in previous research, the number of occupations held prior to referral was related to employment outcome. Unfortunately, occupational information was not systematically or consistently collected by the rehabilitation counselor. Procedures need to be instituted that will ensure that the case work supervision process attends to the consistent collection and use of work histories in the rehabilitation counseling process.

Practice Issues

1. Since diabetic retinopathy, optic nerve atrophy, and cataracts appear to be the leading causes of blindness for clients likely to be closed as unsuccessful, rehabilitation professionals need to understand the etiology, treatment, and procedures for each of these types of diseases as well as associated nonvisual disorders. Also, rehabilitation professionals need to know about the availability and uses of both optical and nonoptical adaptive aids and devices that may be employed in the rehabilitation programs of clients with such disabilities, especially those likely to be closed unsuccessfully.
2. Rehabilitation counselors need to arrange for comprehensive medical diagnostic studies of clients with multiple disabilities since additional disabilities and more severe disabilities are characteristics of clients likely to be closed unsuccessful. Diabetic counseling by appropriately trained personnel should also be included to help ameliorate or minimize the effect of diabetes on the role performance of the blind client.

3. Clients likely to be closed unsuccessfully typically have substantial work histories. During the development of the IWRP vocational goal, the rehabilitation counselor and the blind client have an opportunity to review the clientts work history and plan an occupational goal that uses the skills the client possesses. It was noted that occupational histories were not consistently collected by the rehabilitation counselor during application. Preservice and continuing education programs of rehabilitation professionals should include ways in which this kind of client information can be used in the vocational counseling process.
4. Blind clients likely to be unsuccessfully closed are often multiply and severely handicapped. To help avert unsuccessful closures, rehabilitation professionals are expected to need additional training in and knowledge of new technology. Vocational evaluation, vocational training, rehabilitation teaching, and orientation and mobility programs can make use of such skills and knowledge for appropriate clients. Use of such resources is likely to reduce the rate of unsuccessful closure.
5. Age at onset of disability has been found to be an important indicator of rehabilitation outcomes. Individuals having earlier onsets of visual disability were found to constitute a greater proportion of wage earning closures. These findings suggest that blind and visually impaired persons having early onset of disability (preteens) can be expected to be employed in a salaried position or a wage earning situation. Rehabilitation counselors and their supervisors should monitor the progress of cases with early onset closely so that these individuals may receive those services which result in competitive or other wage earning closures.

6. Status 28 closures appear to enter the rehabilitation service delivery system seeking health care services rather than rehabilitation services which lead to job placement. This is particularly apparent when the unsuccessful and competitive groups are compared. It is important for rehabilitation counselors during the initial interview to assess the individual's reasons for seeking rehabilitation services. If it is clear that the individual seeks only health care services, for example, cataract surgery, the rehabilitation counselor should assist the individual to locate another source of payment for the health care. By not accepting this type of case, the rehabilitation counselor's rate of status 28 closures is likely to be reduced, and the counselor will have more time to assist blind and visually impaired persons whose goals are congruent with the mission of the agency.

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